

Railway Age

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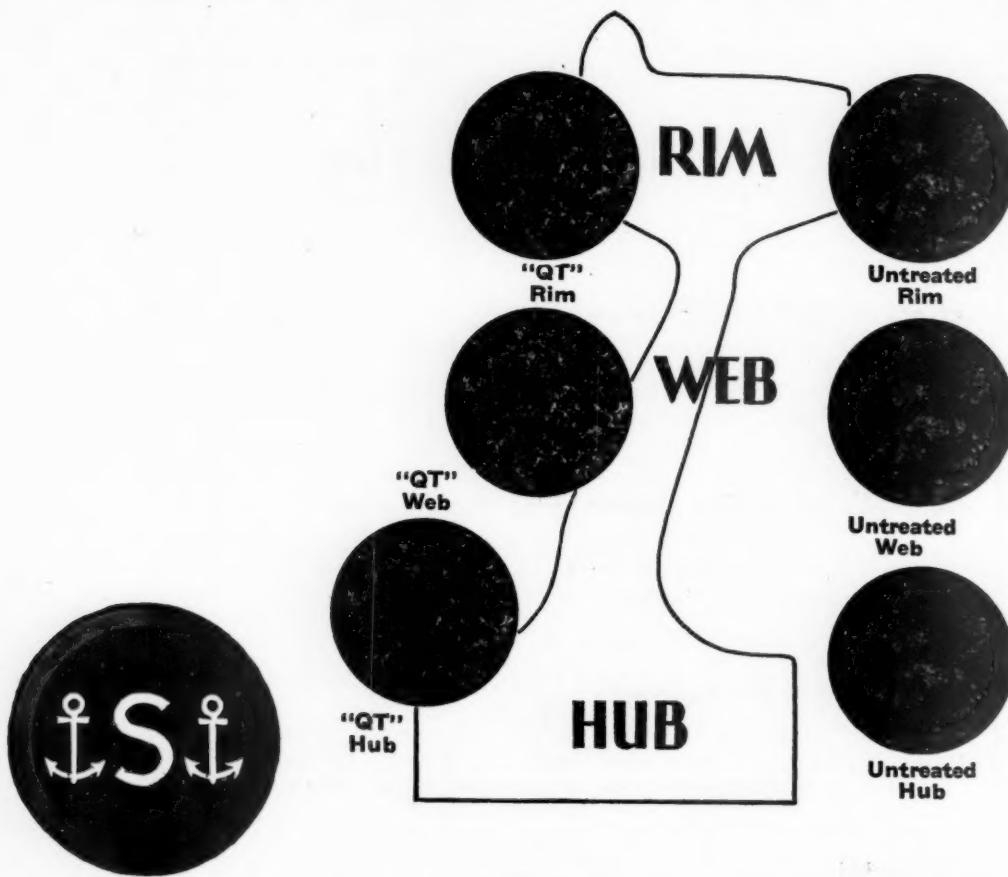
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Business Men and the Transportation Problem

Numerous developments are occurring in all parts of the country which indicate that men engaged in all kinds of business are becoming aroused to the unfairness and menace of the prevailing government policies regarding transportation and are becoming militantly determined to have them changed. A very significant event occurred on November 2 when the board of directors of the Kansas City Board of Trade disbanded its waterways committee and the board's president, W. B. Lincoln, made a statement denouncing government barge line operation in competition with railways.

In his statement, Mr. Lincoln said: "With present government activities directly competing in business with more than 250 lines of business, the Board of Trade renews its declaration that the government should keep out of business, leaving such activities to its citizens. Every business man and tax-paying citizen must demand a halt on the army of lobbyists who annually trek to Washington in raids on our federal treasury. Heretofore appropriations have been made and advantages given under the guise of 'exceptions.' We must now have the courage to place all these 'exceptions' in one bundle and hurl them out of the window. There can be no half-way position." Heretofore most of the business interests of the Missouri Valley have been regarded as in favor of the deepening of the Missouri river and the operation of a federal barge line upon it.

Shippers' Views on Regulation

Under the leadership of the New Jersey State Chamber of Commerce there has been organized a National Association for Motor Truck Regulation, composed of shippers who take the position that "all the competitive transportation agencies should be permitted to flourish under fair and equal treatment." (*Railway Age*, September 10, page 372.)

A special committee of the Chamber of Commerce of the United States, of which Henry D. Sharpe, of Providence, R. I., is chairman, has made a report opposing every form of government competition and citing six important examples of direct and indirect

government competition with the railways such as it condemns. (*Railway Age*, October 1, page 480.)

The New York Chamber of Commerce has announced renewal of its opposition to the Great Lakes-St. Lawrence waterway project. (*Railway Age*, October 15, page 548.)

Citizens of Centralia, Ill., have started the formation of the National Inland Transportation Protective Association to oppose the use of public money for developing inland waterways and to retire the government from the operation of barge lines. (*Railway Age*, October 15, page 550.)

The Citizens' Transportation League has been formed in Minnesota to seek equal regulation and reasonable taxation of all forms of commercial transportation and to foster equal opportunity among the various forms of transportation, and producers and shippers, taxpayers, farmers, railway employees, owners of life insurance policies, depositors in savings banks and "automobile drivers, whose personal safety is endangered by the excessive use of highways by trucks operated for private gain," are invited to join. All the officers are large shippers. (*Railway Age*, October 29, page 623.)

The Committee on Co-ordination of Truck and Rail Service of the Trans Missouri-Kansas Shippers' Board in September reported the answers received from shippers to a questionnaire that it had sent out in its territory. The report said: "On the question, 'Do you favor control of motor transportation, state and interstate?', 292 were in favor of regulation of rates, 25 against; 202 were in favor of regulation of working conditions, 19 against; 238 were in favor of regulation of safety appliances and regulations for safe operation, and 6 against. To the question, 'Do you favor more liberality in railroad rate regulation so that the railroads may be in a better position to meet truck competition?', 292 replied in the affirmative and 20 in the negative."

The Railroad Commission of California recently made an investigation into the operation of the various transportation agencies in that state. In a report issued

on October 10 the commission said: "In the questionnaire sent to shippers and receivers of freight the following question was asked, 'Do you favor the regulation by the state of the rates, rules and regulations of carriers operating on the public highways for compensation?', 1,523 shippers answered in the affirmative and 227 in the negative, 87.04 per cent being in favor of regulation. Those in favor of regulation reported shipments aggregating 14,483,574 tons, and those against regulation, 2,613,180 tons. On this basis, 84.71 per cent of the shippers want regulation."

Business Men Becoming Consistent Regarding Government in Business

The claim has repeatedly been made that the movement for withdrawing subsidies from carriers that compete with the railways, and for applying comparable regulation to all carriers, is merely a movement by the railways and their employees for the selfish purpose of crippling their competitors. It has been claimed with especial frequency that there is no demand from shippers for regulation of highway transportation. These claims may have been true at one time, but they are not true now, as is shown by the evidence above cited, and by much more that could be cited. Leaders in agriculture, industry and commerce throughout the country are awakening to a realization that it is inconsistent for them to demand retirement of the government from competition in their own lines of business, without demanding that it shall retire from direct and indirect competition with the railways; that it is inconsistent to demand reductions of government expenditures without demanding reduction of the government expenditures made to subsidize the competitors of the railways; and that, in fact, the railway situation presents the most acute and menacing of all the problems that have been created by excessive government interference in business and by the increase of taxation for the purpose of subsidizing some kinds of business concerns in competition with and at the cost of, other kinds.

Never in all history was there such a close approach to unanimity among railway managers, railway employees and all classes of producers and shippers as there is now as to the imperative need for a solution of the railway problem and as to the measures that should be adopted to solve it.

Well-informed shippers, because of the commercial demoralization being caused by present competition in transportation, are becoming as strongly in favor of this policy as railway managers. The railways ask

opportunity to engage in transportation on highways and waterways on the same terms as other companies, and there can be no question as to the desirability of this in the mind of any person who has studied the conditions and problems of transportation enough to recognize the plain fact that the best service and the greatest economy in transportation can be secured only by eliminating wasteful competition through close co-ordination of all transportation agencies.

Effects of National Election

The changes in legislation necessary to put all carriers on a parity and foster needed co-ordination must be made by both state legislatures and Congress. The attitude of law makers is, of course, largely determined by political considerations, but with the pressure which promises to be put upon public men by organizations of shippers and of railway employees, there seems good reason for hoping that in the near future the railways can get a square deal from our governments; and after that the solution of the railroad problem will become, more than it has been for many years, that of the adjustment of railway service, operating costs and rates to changing conditions by railway managements themselves.

Many business men have anticipated the result of the recent national election with profound misgivings. The *Railway Age* has not shared in these apprehensions. As to the transportation problem, it has not been a partisan issue, and the leaders of both political parties committed themselves during the campaign to supporting somewhat the same measures for solving it. As to general business, the leaders of the victorious party, whichever it was, were bound to recognize the fact that

in the elections two years and four years ahead the test applied to them by the voters would be how much business had improved since the election of 1932, and therefore seemed sure to try to get adopted those measures which would help business, including necessarily the railroad business.

Giving full weight to the results of the election, it is our opinion that if railway managements will courageously ask for those changes in legislation which, in fairness, the railways are entitled to have made, and will individually and in co-operation do those things to improve general business and restore railway earning capacity that only the managements can do, they will receive such support from business men and the public in their efforts to secure a solution of the railroad problems as they have not received since the passage of the Transportation act in 1920.

Government in Business

Omitting consideration of Russia, the United States Government is, today, the greatest business institution in the world. It carries on business directly, as in operating the post office department and the Panama Canal. It is a holding company, owning securities in subsidiary corporations, such as the Inland Waterways Corporation and the Federal Land Banks. It may be likened to a trust company, for it administers the trust funds for the Indians and for the Alien Property Custodian. It is in the insurance business, providing policies for veterans of the World War. And finally, it is the greatest banking institution in the world and operates in the Reconstruction Finance Corporation the largest single lending organization in existence. Through the latter, it extends credit and, through the Postal Savings Banks, it receives deposits.

—From the Index, published by the New York Trust Company.



In Stretchers Neck Tunnel, Showing the Mucker in Operation and the Shield Used to Protect Traffic

Effective Methods are Employed in Enlarging Tunnels on C. & O.

Permit increasing size of five old bores under heavy traffic
with safety and minimum delay to trains or work

Part II

IN ADDITION to the five new single- and double-track tunnels which the Chesapeake & Ohio has drilled through ridges in its crossing of the Alleghany mountains in Virginia and West Virginia, work in connection with which was described in the *Railway Age* for November 5, there are eight other tunnels involved in the road's extensive tunnel enlargement project, six of which have been enlarged to permit unrestricted double-track operation. Hampered and restrained by 50 to 70 train movements in 24 hours, the enlargement work on these tunnels has been beset with many difficulties and problems. However, it has been carried out in a most effective manner, with relatively few delays to trains, and a minimum of interference with the work itself.

The six tunnels enlarged include Moore's and Lake's tunnels, 324 ft. and 727 ft. long, respectively, near Backbone, Va.; Kelly's tunnel, 496 ft. long, near Jerry's Run, Va.; White Sulphur tunnel, 277 ft. long, located about a mile east of White Sulphur Springs, Va.; Stretchers Neck tunnel, 1,894 ft. long, near Prince, W. Va.; and Shoo Fly tunnel, 192 ft. long, near Gauley, W. Va. The other two tunnels involved are Pope's Nose and Blue Hole tunnels, 189 ft. and 660 ft. long, respectively, between Cotton Hill and Gauley, W. Va., both of which have been eliminated, the former by converting it into an open cut, and the latter by a line change.

One of the most extensive, difficult and interesting of

the enlargement projects was in Stretchers Neck tunnel, the long single-track bore near Prince. This tunnel had a width of only about 14 ft. and provided a vertical clearance of only about 14½ ft. at a distance of 4½ ft. from the center-line of track. Here, where difficulties at both portals, including the movement of a county road, made it inadvisable to drive a new single-track bore parallel with the old tunnel as was done in several of the projects described in the first installment of this article, the old bore was enlarged and is being lined under traffic to the standard double-track tunnel section of the road, 32 ft. wide and providing 22 ft. vertical clearance above each track, 5 ft. out from its center-line.

Heavy Work Involved

One of the greatest difficulties encountered in the work at this tunnel was in moving the west portal back a distance of 320 ft., which was necessary because of a huge slide of unstable material over the old portal which promised to make enlargement of the tunnel section hazardous if not practically impossible. Here, the whole face of the mountain to a depth of about 320 ft. from the portal to ledge rock had broken away from the parent mass and bore down on the old tunnel. Consisting of earth, gumbo and loose rock, this slide never became fully stable, as the result of which it had been necessary on several occasions to interline the original

brick lining, installed only in the west end of the tunnel, to restore or to increase its strength.

Realizing that the greatest of difficulties would be encountered in enlarging the west end of the tunnel under the conditions presented, and that the finished section would, in all probability, be subject to a continuation of difficulties and thereby remain a constant source of trouble, it was decided to cut the old tunnel back to ledge rock by removing all of the over-bearing unstable material. This work involved approximately 450,000 cu. yd. of excavation and produced a cut about 800 ft. across from rim to rim, with side slopes approximately 700 ft. in length. The excavation was made in lifts, using steam shovels and 5-yd. side-dump cars, in the main, although a number of 2½-yd. dump trucks were used effectively in carrying away a large part of the material excavated in the higher levels. In the top half of the cut, deep holes for shooting were put down with well drills and rather heavy charges of explosives were employed, but as the cover over the old tunnel lining was reduced, the depth of holes and size of shots were correspondingly cut down to avoid any premature damage to the lining.

With the old lining uncovered down to the haunches, it was demolished by blasting in sections of 5 to 25 ft. at a time, depending largely upon the amount of time between trains. Proceeding cautiously at first, the arch alone was broken down, in short sections, while the side walls were left braced by the original fill. Later, however, with sufficient time between trains, the length of sections was increased and the entire arch ring and sides were demolished at the same time. Throughout the first 100 ft. of lining, the brickwork was blown down directly

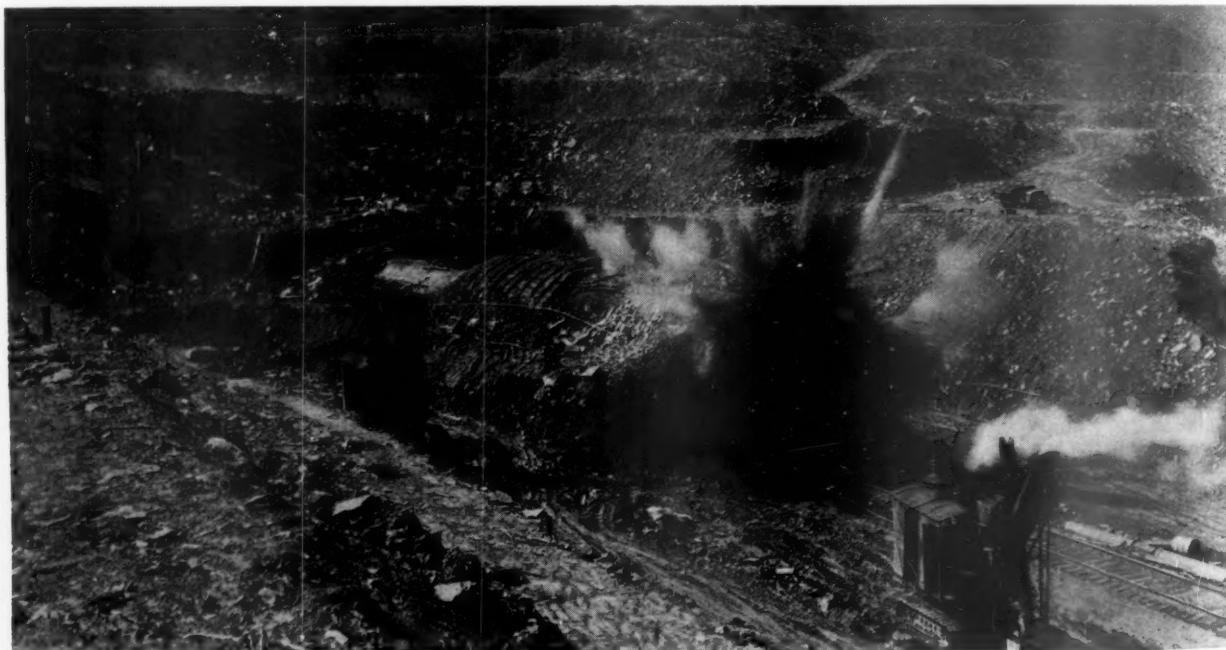
being enlarged to double-track section. To protect traffic during this work, a heavy steel and timber shield, made up of four 30-ft. sections mounted on traveler wheels, was moved into the tunnel and, as the work advanced, was jacked ahead to afford complete protection to the track at all times throughout the immediate range of the enlarging operations.

The shield was made up originally of steel arch sets, lagged with timber and reinforced with old steel rails. The sets, which had three-segment tops, were made up of two 12-in. channels, back to back. These were spaced five feet center to center on a structural steel footing member.

Because of damage done by the early blasting operations, it became evident that the shield would have to be strengthened and the lagging given greater resistance to the shattering action of the blasts. In effecting this strengthening, timber sets of 12-in. by 12-in. timbers were installed between the steel sets, the gussets of the steel sets were increased in size, and steel shatter plates, shaped to fit the top of the shield, were provided to lay over the lagging. Furthermore, during shooting, that part of the shield directly beneath the shots was braced laterally and vertically.

Because of the restricted size of the tunnel, considerable scaling of the walls and roof was necessary before the shield could be moved into and forward in the tunnel as the work progressed. This preliminary work was done by men operating on a car-mounted scaffold, which was moved out of the tunnel to clear for trains.

In the scaling operations, sufficient rock was removed from the north wall of the tunnel to permit the placing of 12-in. by 12-in. plumb posts and a 12-in. by 12-in.



Demolishing a Section of the Old Lining Uncovered at the West End of Stretcher Neck Tunnel

on to the track where it was thrown to the side rapidly by crawler-mounted shovels, to be loaded later into trucks for disposal. In removing the remaining length of the old lining, for fear of causing breakages in the tunnel itself, the lining was broken up by light shots while supported on steel centering lagged with heavy steel plates.

Shield Protected Train Operation

While this work was going on at the west end, the main part of the tunnel working from the east end, was

wall plate along that side. Thus, as the shield was moved forward, the timbering of the newly enlarged arch could be brought down to support on the timbering along the north wall.

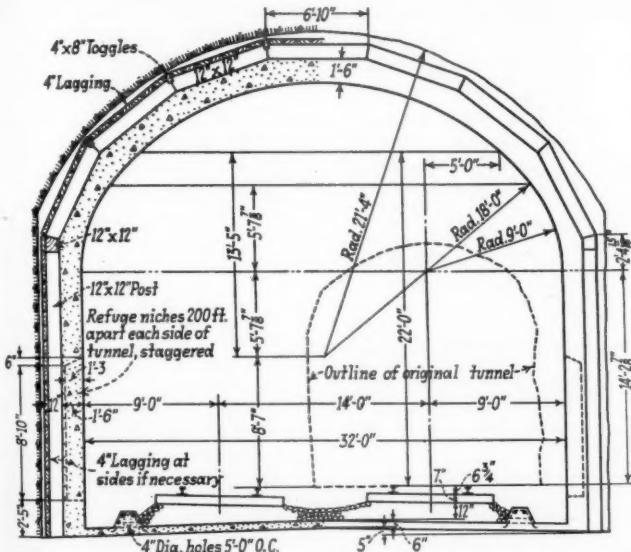
In carrying out the enlargement of the tunnel, a drift was advanced through the rock for setting the south wall plate in its final position. With this drift wall ahead, a heading of the full size of the new tunnel arch, outside of the shield, down to the wall plates, was drilled and shot down, and 12-in. by 12-in. timbers were installed in

a seven-segment arch between the plates. Immediately behind the heading the remaining excavation was taken out in two benches and plumb posts were set along the south wall. Blasting in the heading and benches was permitted only between trains, and even then was done with care to avoid damage to the shield.

The material excavated in drifting for the south wall plate was wheeled in barrows to the bench face and was there dumped, to be picked up with the rock removed from the bench, which work was done with a full-circle, $\frac{1}{8}$ -yd. Erie mucker, operated by air, which loaded the muck into four-yard side-dump cars.

Following the procedure outlined, and working under the difficulties presented by the almost constant presence of smoke and gases from locomotives, in spite of the fact that fresh air was pumped constantly into the heading, the work progressed quite uniformly. In all, approximately 48,400 cu. yd. of rock, mostly sandstone and shale, were removed.

In the finishing-up operations, which are now under



Typical Section Through Stretcher Neck Tunnel as Enlarged, Showing New Track Structure and Relative Size of Old Bore

way, the enlarged tunnel is being lined with concrete, and will be provided with a concrete floor with a ballast wall along each side of the tracks. In this latter work, the flooring will be laid first on the south side of the tunnel while traffic is maintained on the north side, and then, with the track and traffic shifted to the south side, the flooring will be laid on the north side.

Enlarging Double-Track Tunnels

The four other tunnels on the C. & O. where extensive enlargement work has already been completed or is under way, were all double-track bores, lined with brick, but far from the present standard section in size. These are Kelly's tunnel, 496 ft. long; Moore's and Lake's tunnels, 324 and 727 ft. long, respectively, and White Sulphur tunnel, 277 ft. long. In the case of these tunnels, their width was only 26 to 28 ft. and their vertical clearance, $4\frac{1}{2}$ ft. out from the center-line of tracks, was only 15 to 16 ft.

The work involved in all of these tunnels was similar in character and has been carried out by substantially the same methods. This consists of drifting in over the old lining, the setting of arch timbering to support the new roof, the breaking down and removal of the old lining,



Enlarging the Old Double-Track Tunnels, Showing Portal Chutes for Disposing of Muck in Early Stages

the setting of plumb posts, and then the installation of the concrete lining, all under traffic.

In cutting in over the old lining to the full new arch section, wall plate drifts were pushed ahead first on both sides. As this work progressed, using small shots and loading the material largely by hand, seven-segment timber arches, using 12-in. by 12-in. timbers, were put in on 2 to 4-ft. centers as conditions required. Near the portals, much of the muck was wheeled out to the portals through the drifts, where it was dumped over chutes into small capacity narrow-gage side-dump cars at the track level.

Further back in the tunnels, the main tracks were gauntletled and the narrow-gage service tracks were extended into the tunnel on both sides. Here, holes were cut through the old lining on each side at frequent intervals, and the muck was dumped through these holes over chutes directly into the dump cars.

Large Cavities Found Above Old Lining

At a number of points in these tunnels, where the old lining showed evidence of weakness or inability to sustain the blasting and cutting operations, temporary timber bents were installed beneath the lining. This was done also at several points where large cavities were found above the old lining, the walls of which were not self-



Looking Down on the Uncovered Old Lining at the West End of Stretcher Neck Tunnel—Note Work Progressing Without Interference With Traffic

sustaining for any length of time after being exposed to the air.

The largest of the cavities found was in the work on Lake's tunnel, where one cavity, lying longitudinally over the old lining, was from 120 to 130 ft. long, from 5 to 7 ft. high, and practically as wide as the tunnel itself. These cavities, most of which were in a soft seamy shale, were, apparently, formed by the disintegration of the timber packing provided originally. The walls had stood up well under the sealed conditions which prevailed, but once exposed to the air became very unstable. Where this situation was encountered, the whole lining was reinforced beneath by heavy timber rings as already mentioned and the roofs of the cavities were shored up on the top of the lining. As the enlargement work progressed, full arch timbering replaced the shoring.

The old brick arch was shot down in relatively short sections, using light charges in numerous holes to break it up well and, at the same time, avoid damage to the temporary timbering in the new arch ring. This was done successfully, the only special precaution taken being to prevent the shifting of the timber rings laterally by tying them together on their under sides by means of longitudinal timbers spiked at each ring. Loading of the broken down lining was done by a full-circle, air-operated shovel.

Following the enlargement of the tunnels, and, in certain cases, even before this work was completed, the concrete lining work was started. In this work, which was done in a manner more or less similar to that in the new Alleghany tunnel, described in the first installment of this article, steel or wooden forms were used and the concrete above the spring line was placed with a pneumatic placer or concrete gun.

The work in connection with the four tunnels enlarged involved 40,240 cu. yd. of tunnel excavation and breakage, 39,000 cu. yd. of excavation in widening out the approach cuts, 1,112,000 f.b.m. of tunnel timbers, and 14,600 cu. yd. of concrete in the linings.

Two Tunnels Eliminated

Between Cotton Hill and Gauley, W. Va., a distance of about 3½ miles, at the west end of the tunnel territory, three other tunnels, Pope's Nose, Blue Hole and Shoo Fly, all with restricted clearances, were given consideration, and at the same time, the single-track line between these tunnels was double tracked with some improvement in alignment. Old Pope's Nose tunnel, a 189-ft. unlined, single-track bore, was made an open cut of sufficient width for two tracks; old Blue Hole tunnel, a 660-ft., unlined, single-track bore, was entirely avoided in a double-track line change; and old Shoo Fly tunnel, an unlined, two-track bore, 192 ft. long, was enlarged somewhat by scaling off its roof and sides. Approximately 600,000 cu. yd. of excavation was involved in this work, including the removal of approximately 25,500 cu. yd. in uncovering Pope's Nose tunnel and the placing of approximately 175,000 cu. yd. in a fill constructed in making the line change around Blue Hole tunnel.

All of the work described was carried out under contract under the direction of C. W. Johns, chief engineer of the Chesapeake & Ohio. Carpenter, Major Brothers & Company, Inc., Clifton Forge, Va., and Boxley Bros., Orange, Va., handled the work in Stretcher's Neck tunnel; Sturm & Dillard Company, Columbus, Ohio, handled the work in Moore's, Kelly's and Lake's tunnels; the Walton Construction Company, Roanoke, Va., handled the work in White Sulphur tunnel; and Waugh Bros., Inc., Fayetteville, W. Va., handled the double

tracking and tunnel work between Cotton Hill and Gauley.

The following resident engineers of the Chesapeake & Ohio have been in charge of the different parts of the work under the supervision of E. G. Rice, district engineer; P. L. Graves at Stretcher's Neck tunnel; J. A. Cooke, at Moore's, Kelly's, Lake's and White Sulphur tunnels; and H. S. Purdon, on the double tracking and tunnel work between Cotton Hill and Gauley.

Freight Car Loading

WASHINGTON, D. C.

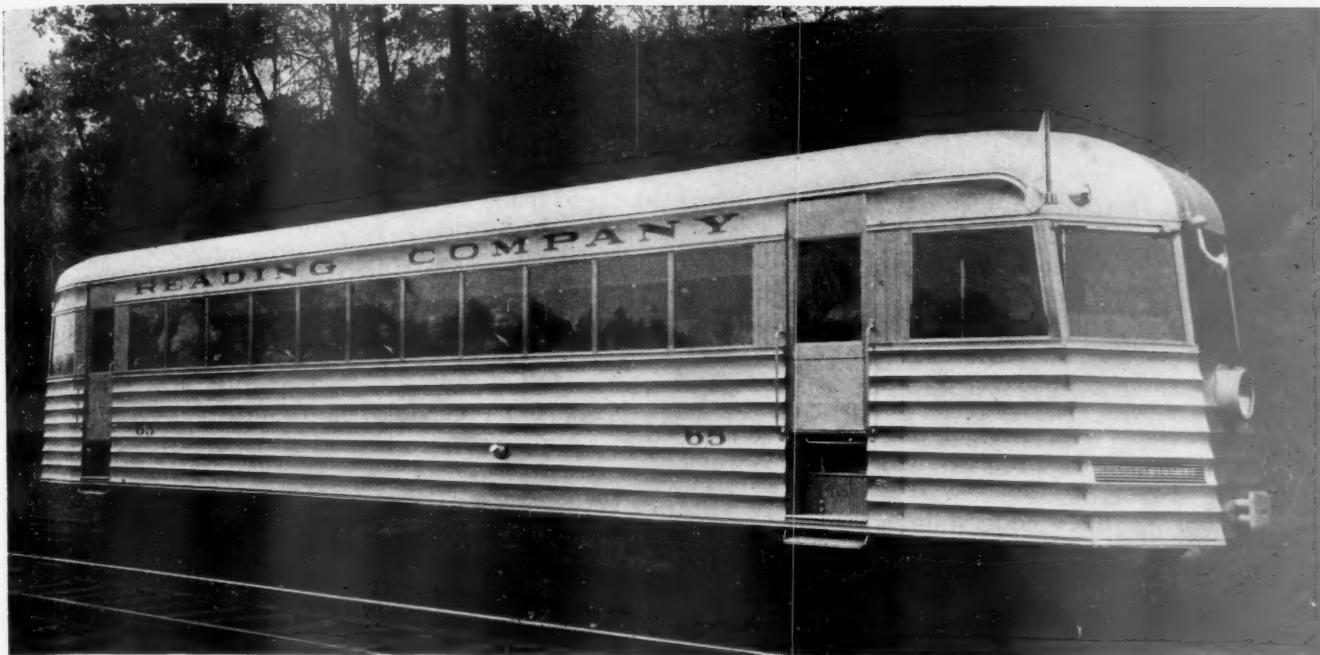
REVENUE freight car loading in the week ended October 29 amounted to 617,642 cars, a decrease of 24,531 cars as compared with the preceding week, but of only 122,721 cars as compared with the corresponding week of last year. As compared with 1930 it was a decrease of 317,073 cars. Loading of forest products showed an increase of 283 cars as compared with the preceding week, but all other commodity classifications showed reductions. Coal loading decreased 11,936 cars, and miscellaneous loading decreased 10,101 cars. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading			
	Week Ended Saturday, October 29, 1932		
Districts	1932	1931	1930
Eastern	131,725	161,339	203,414
Allegheny	111,859	147,410	177,897
Pocahontas	45,909	47,837	56,603
Southern	91,666	107,093	133,436
Northwestern	75,175	88,029	132,195
Central Western	103,104	122,843	154,174
Southwestern	58,204	65,812	76,996
Total, Western Districts	236,483	276,684	363,365
Total, All Roads	617,642	740,363	934,715
Commodities			
Grain and Grain Products	31,951	41,275	44,347
Live Stock	23,608	28,990	32,459
Coal	128,869	141,068	176,257
Coke	4,528	5,286	8,848
Forest Products	18,856	23,646	38,134
Ore	6,019	12,656	35,063
Merchandise L. C. L.	177,662	214,339	240,582
Miscellaneous	226,149	273,103	359,025
October 29	617,642	740,363	934,715
October 22	642,173	769,673	959,492
October 15	650,578	761,596	931,105
October 8	625,636	763,818	954,782
October 1	622,075	777,712	971,255
Cumulative total, 43 weeks	23,512,787	31,757,157	39,129,295

Car Loading in Canada

Car loadings in Canada for the week ended October 29 amounted to 46,693 cars. This was a decrease from the previous week's loading of 3,182 cars, and the index number dropped from 64.22 to 58.32. In past years there have been seasonal increases up to the end of October, but this year, due principally to a very heavy movement of grain in September, total loadings have declined since the middle of September. Total merchandise loading amounted to 13,607 cars, as against 13,654 cars for the previous week and 14,976 cars for the forty-third week last year. The usual trend is downward at this time, and consequently the index number rose from 77.19 to 78.17.

	Total Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
October 29, 1932	46,693	18,728
October 22, 1932	49,875	18,935
October 15, 1932	46,774	18,143
October 24, 1931	61,836	23,196
Cumulative Totals for Canada:		
October 29, 1932	1,820,458	817,932
October 24, 1931	2,121,162	1,091,042
October 25, 1930	2,653,664	1,435,695



The Second Budd-Micheline Rail Car

Budd-Micheline Car Delivered to the Reading

**Seats 47 passengers—Diesel-electric power plant is built
into one truck and motor drive in the other**

LAST spring the Edward G. Budd Manufacturing Company, Philadelphia, Pa., designed and built a self-propelled rail car embodying a combination of rubber tired wheels and a body of extremely light weight for use in light branch-line service. In this design the car-body load was carried on a trussed underframe structure with sections built-up of thin high-chromium-steel sheets of stainless quality, using the Budd Shotweld process of spot welding. The car was carried on two six-wheel trucks with pneumatic rubber tires developed by the Michelin Company in France especially for operation on rails. This first demonstration car was 40 ft. 8 $\frac{1}{4}$ in. long with a seating capacity of 40 passengers and an unloaded weight, complete with a 125-hp. gas engine and mechanical transmission, of 13,500 lb. This amounts to 340 lb. per seated passenger.*

The first car involving the principles of this design to be built for a railroad was delivered at the end of October to the Reading Company. This car is 50 ft. 1 in. long overall, has a seating capacity of 47, and weighs complete, with a 125-hp. oil-engine power plant, 22,000 lb.—468 lb. per seated passenger.

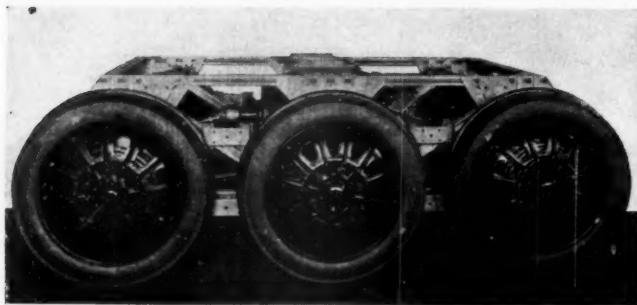
The body structure of the new car is of essentially the same type as that of the earlier one. Thin sheets from which the structural members of the frame are built-up and with which the exterior of the car is enclosed are stainless steel cold-worked to a tensile strength

of 150,000 lb. per sq. in., on which no protective coatings are necessary to prevent corrosion. The main structural members of the car body weigh about 900 lb. and its total weight is 8,200 lb., of which 3,700 lb. are stainless steel.

In the Reading car the truck frames, unlike those of the first Budd-Micheline car, are of stainless-steel trussed structure. One of these trucks is designed to carry the entire power plant disposed longitudinally with the oil engine over the axle at one end of the generator outside of the axle at the other end. Completely equipped, this truck weighs 7,000 lb., of which the stainless-steel frame accounts for but 281 lb. In the driving truck the motor is mounted in the bolster under the center plate with its axis longitudinal. At each end the shaft is coupled through universal joints to differentials in the front and rear axles. This truck is fitted with sand boxes arranged to sand the rails ahead of the driving wheels in either direction. It weighs about 4,300 lb., the weight of the frame alone being 230 lb.

The engine sets low in the power truck and a slight elevation of the floor of the vestibule at the power-truck end of the car is required for clearance. For inspection purposes, the floor above the engine is constructed in sections which are quickly removable. The power plant is rendered accessible for maintenance purposes by lifting the front end of the car and rolling the truck out. Provision has been made for readily disconnecting all wiring and piping from the body. By this method of engine mounting engine noise, vibration

* For a description of this car see the *Railway Age* of March 5, 1932, page 401.



The Drive Truck

and odor have been kept out of the car body and the center of gravity kept low.

The wheels, of Budd design, are of removable disc type to accommodate Michelin-Goodyear pneumatic tires which are furnished exclusively to the Budd Company. Following the Michelin principle to prevent interference between the metal flange and the track in case of deflation, a solid metal ring mounted on the tire rim projects outward within the 33-in. by 4½-in. tire to a point within 5/8 in. of the inside of the loaded tread under normal inflation of 100 lb. per sq. in. Brakes of the internally-expanding type, operated by the Bendix-Westinghouse air brake, are installed on the four outside wheels of each truck. Tru-Stop hand emergency brakes operate on the two middle wheels of each truck.

The power plant consists of a 125-hp. Cummings Diesel engine directly connected to a Westinghouse 250-volt generator of special light-weight construction. Included with the engine generator set in the front truck are the batteries and controls. The car is driven by a high-speed Westinghouse motor through 9 to 1 Timken differential worms in the two outer axles. The engine is started by motoring the generator with power drawn from the storage batteries. The No. 2 fuel oil is carried in a tank under the car body.

The car has an acceleration of 2 m.p.h. per sec. and is designed for a maximum speed of from 50 to 55 m.p.h. The deceleration rate can also be made very high as compared with customary railway practice owing to the high factor of adhesion. The car can be stopped in about 400 ft. from a speed of 55 miles an hour.

The interior of the car is simple in appearance, with the ceiling extending down in a smooth curve to the

tops of the windows. As in the former car, a central duct, dropped below the ceiling, extends throughout the length of the passenger compartment to provide for wiring, lighting and ventilators. Light from sources in the sides of this duct is distributed by reflection from the head lining and sides of the car above the windows. This arrangement is said to provide ample reading illumination with a reduction of about 75 per cent in the electrical load as compared with standard equipment.

The car is indirectly heated by hot water from the engine jacket under thermostatic control. Forced ventilation is provided by two fans with a capacity of 1,200 cu. ft. per min. The air is drawn through a hot-water radiator and distributed uniformly to the car interior through floor ducts. The air is exhausted through roof ventilators mounted over the ceiling duct. The outlet from the car interior is through grilles in the sides of the duct. The windows are permanently closed.

The interior of the passenger compartment is 31 ft. 1½ in. It is fitted with reversible double seats 40 in. wide, with a 26-in. aisle between. The seat frames are of steel tubing and drop forgings fitted with leather covered rubberized hair upholstery and weigh 52 lb. each. They are provided with arm rests at the aisle ends. A seat in the rear vestibule will accommodate

Dimensions and Weights of the Reading Budd-Micheline Rail Car

DIMENSIONS:

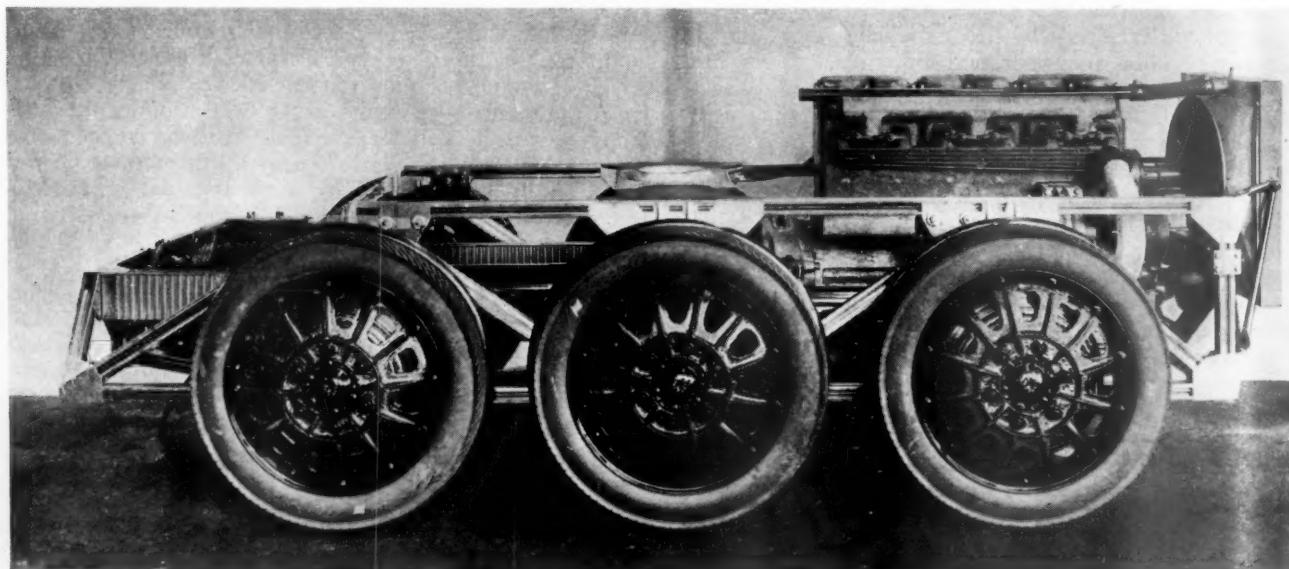
Length overall.....	50 ft. 1 in.
Inside width.....	9 ft.
Outside width (to clear).....	9 ft. 11 in.
Height above rail.....	11 ft. 5 in.
Height floor to ceiling.....	7 ft. 5¾ in.
Length of passenger compartment.....	30 ft.
Length of vestibule.....	8 ft. 11½ in.
Height vestibule floor to ceiling (over power plant).....	6 ft. 10¼ in.
Width of vestibule doorways (to clear).....	27 in.
Distance between truck centers.....	30 ft. 1 in.
Truck wheel base.....	6 ft. 8 in.
Tires.....	33 in. by 4½ in.
Tire air pressure.....	100 lb. per sq. in.
Seating capacity.....	47

WEIGHTS:

Body.....	8,200 lb.
Truck and power plant, complete.....	7,000 lb.
Driving truck.....	4,300 lb.
Controls, wiring and miscellaneous.....	2,500 lb.
Total weight	22,000 lb.

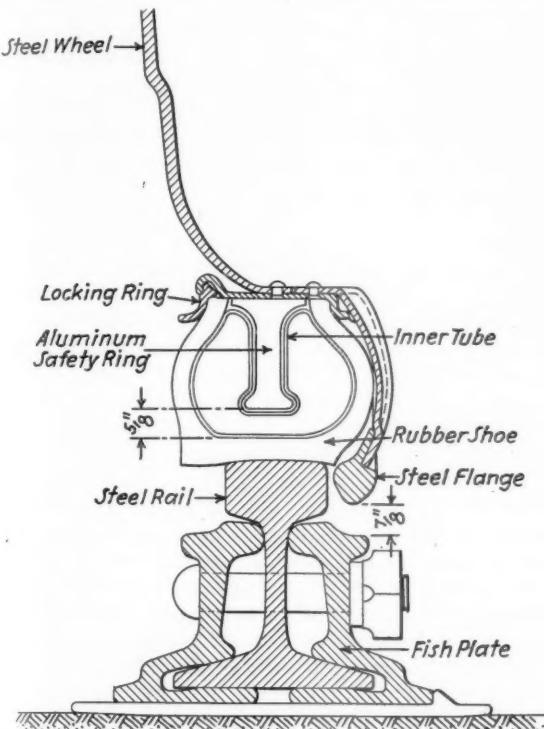
three persons. The car floor is of welded corrugated stainless steel covered with cork tiling.

The vestibules are about 8 ft. in length and are provided with side and trap doors over the steps which are centrally operated by air engines. Folding steps which extend below the body of the car are also operated by the door engines.



The Power Truck Embodies a Complete Diesel Electric Power Plant

The car is arranged for double-end control. At each control station the oil pressure, water temperature and speed indications are all relayed by light circuits. Standard head and signal lights are built into the body. The insulation of the car from the tracks effected by the



Cross-Section of the Wheel, Tire and Flange

rubber tires requires special equipment for the purpose of signal operation. In this car has been installed a system developed by the Budd Company in co-operation with the Union Switch & Signal Company consisting of four pairs of rocking brushes supported between the wheels on the trucks and energized by an auxiliary current.

The cost of operating this car is placed by the builders at about 12 cents per mile which includes fixed charges as well as the direct mileage costs. A month's operation of the preceding car, during which it traveled 2,150 miles and carried 2,181 passengers, was \$24.96 for fuel and lubricating oil.

Humane Live-Stock Car Tested in Service

THE transportation of live poultry requires more light and ventilation, as well as easier riding qualities, than are usually found in ordinary freight equipment. Believing that these features which have popularized live-poultry cars, will prove equally advantageous in other live-stock cars, the Palace Live Poultry Car Division of the North American Car Corporation has recently designed and built a double-deck stock car, intended to provide improved transportation facilities for the shipment of small animals, such as sheep and hogs.

The first Humane live-stock car, constructed to the new design, was converted from a standard live-poultry car and has been in successful operation, largely on eastern carriers, for a number of months.

The car measures inside, 36 ft. long and 9 ft. 6 in. wide, giving a loading space of 342 sq. ft. for each deck. This is greater than the capacity of the average stock car in the 36-ft. class. The inside height 9 ft. 3 in., allows 8 in. more head room than is ordinarily available. The car is equipped with the same trucks, couplers, draft gears, brake appliances, etc. as were used in live-poultry handling service. The light weight of the car has been reduced, by the conversion, from 53,000 lb. to approximately 40,000 lb.

In converting this car, it was necessary practically to rebuild it from the sills up. The interior structure, which housed 128 poultry coops on 8 decks, as well as the caretaker's compartment, was removed. When completed, the external design of the car followed closely the general lines of a live-poultry car. It has an all-steel superstructure with diagonals between the uprights. The sides are covered with screened panels spaced far enough apart to permit hose feeding en route. The ends are of solid steel with barred end doors extending the full height of the car. These end openings have two sliding wooden doors which can be closed during bad weather. The car has a standard double-board roof with insulating paper between the two layers of boards.

The car interior is double-decked, loading doors being provided for each deck at the center of the car. Bumping boards are installed along the lower sides of both



Double-Deck Stock Car with
Storm Doors, Converted from
"Humane" Live-Poultry Car

decks to prevent injury to animals from being forced against the screens or uprights. Four roll-type protective doors are hinged from the roof and may be lowered by operation of a single hand-wheel on the end of the car to protect stock on the upper deck. Similarly, four additional roll-type doors are provided for the protection of stock on the lower deck and may be raised or lowered as desired by revolving a single shaft, extending the length of the car under the upper deck, and provided with a hand-wheel on the outside end of the car. These doors fit closely against the uprights and afford a maximum of protection against the severest of weather. Spaces are provided to permit nozzle-feeding with the doors in the closed position.

The combination of the lighting and ventilating features, with easy-operating storm doors, has made this car a radical departure from the type of stock car now in general use. On several trips from the Middle West to the Atlantic seaboard, excellent results are reported as to the weight and condition of the loads on arrival at destination. As a result of these successful experimental trips, it is expected that additional live-poultry cars will be converted to the new design of double-deck stock car.

Waterways Committee Abolished by Trade Body

STATING that "this exchange has and will continue to oppose all encroachments of government in private business" and that "there can be no exception in the barge-line business," W. B. Lincoln, president of the Kansas City Board of Trade, issued a statement on November 2 announcing the discontinuance of the Waterways committee of that organization by action of the board of directors. Mr. Lincoln's announcement, which pointed to the expenditure of millions of dollars of the taxpayers' money in the construction and operation of barges in competition with the railroads, is given below:

"The waterways committee was established by this exchange 14 years ago for the express purpose of co-operating with other business and civic organizations of Kansas City in the development and control of the channels of the Missouri river for navigation. The co-operation of these various groups has made possible rapid strides by our government in placing this stream under control. In general this exchange feels that the necessity for such control of banks and channels involves upon our government a duty to further this work in the protection of life and property.

"In the past few years, however, a new and supplemental effort has been sponsored by various interests to place our government in the river transportation business, in competition with private carriers. Millions of dollars of the taxpayers' money has been expended in the actual construction and operation of barges. The appropriation of these large sums of government money to encourage further federal bureaucratic encroachment does not contribute to the general welfare of business or citizens and should be abandoned.

"We have discontinued the Waterways committee of this exchange so that the position of this organization may not be misunderstood in the light of present events. A recent announcement by the Waterways committee of the Kansas City Chamber of Commerce that it would present evidence before the Shannon committee to offset demands that the government be removed from the

barge line business, shows a decided cross section of purpose in this vital matter.

"To illustrate the inconsistency of further submerging our government into the barge line business, we cite the case of the Reconstruction Finance Corporation which is lending millions of dollars for the survival of railroads, and out of the same treasury dish we seek more millions of dollars to construct and operate barges to compete at a loss with distressed rails.

"Many statements have been issued by advocates of a federal barge system, which do not adhere to facts. The Secretary of War has asserted several times that the value of the Kansas farmers' wheat would be enhanced '10 cents a bushel because of decreased water transportation charges,' as compared to the rail rates. The facts are that wheat has been shipped by rail from Kansas City to the Gulf for as low as 11 cents a bushel. Barges then would be required to transport such shipments for one cent a bushel to meet existing competition. That would be out of the question.

As prices for one-third of the wheat acreage of the United States are based on Kansas City, we have taken the leadership in lowering transportation costs to this terminal market, which directly affect the producer and in which he is primarily interested. He is secondarily interested in the transportation costs beyond the market and we have taken the lead to secure for the producer and the market transportation charges that do not discriminate against the producer. Prices must necessarily be based on rail transportation costs and, therefore, our efforts have been to protect the producer and the market in such costs. The barge rates are only incidental and do not affect the price paid to the producer.

"During these distressing times, private business generally is clamoring for the end of government bureaucracy and domination of private business. Industry is concerned primarily with eliminating such unfair competition and the reduction of federal expenditures. Much of the overwhelming tax burden has been brought about by the clamor of groups for government aid, resulting in the establishment of needless bureaus, commissions, etc., until at the present time we are face to face with an appalling growth of government activities so extensive that approximately one out of every 12 persons gainfully employed in the United States is on the government payroll.

"The time is at hand when business is fighting for its very existence. Two of the greatest problems confronting industry are government in business and the tremendous load placed on tradesmen in the mounting costs of government operation. It is not necessary to point out that the position of the Kansas City Board of Trade in this matter is the consensus of organized industry in this territory. We look to organizations representative of business to maintain unequivocal opposition to these momentous problems impeding the progress of our operations and trade.

"Members of the Kansas City Board of Trade, dealing with perhaps more persons in this great territory than any other organization, wish to emphasize their interest and civic pride in creating a betterment of conditions in this trade area. This exchange has been sponsoring and subscribing to many projects in the upbuilding of its territory and great terminal center. However, we must emphasize that this exchange has and will continue to oppose all encroachments of government in private business. There can be no exception to the barge line business. We do not feel that it is necessary for our government to subsidize water transportation. If a demand for barges exists, private initiative and capital would be attracted in the building and operating of this

transportation facility, the same as in all other legitimate industry. This demand is not evident.

"With present government activities directly competing in business with more than 250 lines of business, the Board of Trade renews its declaration that the government should keep out of business, leaving such activities to its citizens. Every business man and tax-paying citizen must demand a halt on the army of lobbyists who annually trek to Washington in raids on our federal treasury. Heretofore, appropriations have been made and advantages given under the guise of 'exceptions.' We must now have the courage to place all of these 'exceptions' in one bundle and hurl them out the window. There can be no half-way position."

Divergent Views on Canada's Railway Problem

PUBLICATION of the full text of the report of the Canadian Royal Commission on Transportation reveals some interesting recommendations made to that body by various persons and groups which were not made public at the time the presentations were made.

A variety of views was set forth to the Commission by the governments of the three prairie provinces, Manitoba being opposed to "the continuing effects of economies," Saskatchewan and Alberta urging construction of more small branch lines to encourage settlement in the northern parts, Manitoba and Alberta resisting any move to destroy the identity of the Canadian National, and all of them expressing eagerness to co-operate with the two railways in eliminating the unfair competition of the truck and bus.

Addressing the Commission when sitting in Winnipeg, W. J. Major, attorney general of Manitoba, said, "the government of Manitoba is opposed to such reductions of railway services and employment as will shift the losses now being borne by the railway companies on to other classes which already are bearing greater burdens. The government of Manitoba is also opposed to any form of amalgamation of the railway systems."

On behalf of the province of Saskatchewan Attorney General MacPherson expressed to the Commission strong opposition to any absorption of the Canadian National by the Canadian Pacific, but "you will find a body of sentiment that will say the Canadian National could absorb the Canadian Pacific. We urge co-ordination to eliminate wasteful competition, but we oppose amalgamation." Premier J. T. M. Anderson cited many instances of needless duplication in passenger train service by the two roads in his province, and he emphasized to the Commission the importance of increasing transportation facilities in the northern parts of the province in which the Government had been able to induce a large number of the unemployed and those from the "dried out" areas in the south to settle.

While strongly supporting the construction of the proposed railway outlet to the Pacific Coast from the Peace river country through joint action of the two railways Premier J. E. Brownlee of Alberta told the Commission at its sittings in Edmonton that he was more interested in having the railways build small branch lines in the Peace river country and in the northeastern part of his province to keep the present settlers from leaving those areas.

Asserting that the "benefits of competition are very gravely exaggerated and the expense incidental thereto out of proportion to its value to the public" and seeing little real value in trying to mix competition with co-operation, President E. W. Beatty, of the Canadian Pacific submitted to the Commission, during its Ottawa sittings, a plan calling for consolidation of the C. N. R. with the C. P. R. by a lease of the former to the latter.

"Impartial consideration of railway problems," said Mr. Beatty to the Commission, "has been defeated in Canada on occasions by political considerations. The railway duplication which has largely brought about the present situation was strongly protested by the Canadian Pacific but its protests were unheeded because they ran contrary to the then current public policy." Canada, he said, had not sufficient population to create the traffic necessary to support its existing railways if they were to be operated as two separate competing systems.

"These transportation systems," said Mr. Beatty, "represent a capital of over \$3,000,000,000; they are the greatest single agency in Canada; they have been the greatest settlement agencies and the greatest assistance in the development of the country over a long period of years. And yet there is a feeling throughout the country, at least in some parts, that all you have to do is wave a magic wand of some kind and these companies will come through and function as formerly without very much cost to anyone."

A bill giving effect to the recommendations of the Royal Commission is now being debated in the Dominion Senate, with the likelihood that before Parliament passes it, it will be so amended as to be scarcely recognizable, as compared with its original form. Last week, James Murdock, who was minister of labor in the late Liberal government and who has long been a prominent railway labor leader, made a strong plea in the Senate in behalf of railway employees, during the debate on the proposed legislation.

He said that if existing work were divided among all formerly employed there would on some divisions be no more than from three to five days a month for each. He also pointed out that railway pensions were based on earnings for the last ten years of service. Older men were thus naturally anxious to earn as much as possible during the last ten years.

In referring to the Commission's report, he asked if it would be possible to give reasonable assurance of work for railway employees. Co-operation and consolidation would put many more out of work. These men were the victims of railway mistakes, he contended. In concluding he submitted several questions to the government, among which were:

Will it be possible to safeguard in some measure the personal and family welfare of thousands of railroad employees who would be put out of the service as a result of the application of this bill?

Will the generally satisfactory negotiating arrangements between employees and the railway companies be continued?

Should the railway employees who had no part in the construction of excess mileage or in any extravagance be penalized?

What relief or compensation will be given to employees who lose their work, their homes and future opportunity for employment in the service of the railways?

Does the Royal Commission report imply further restrictions in railroad men's earnings by agreement, if possible, and by compulsion, if necessary, through the arbitral board?

The employees, he said, believe that the arbitral tribunal proposed in the bill places too much authority in the hands of one man. They think the Board of Railway Commissioners should have the right to exercise the final judgment which it is proposed to confer on the chairman of the Board.

The Future of the Railways*

"Hitch-hiking" a national trait in dealing with transportation—

Twelve billions spent on rural roads have coincided
with a drop of twenty billions in farm values

By Horatio L. Whitridge

A SHORT while ago one of the leading industrialists of this country was asked what he thought was a good, sound investment, to which he replied, "Beware of anything that moves on wheels, or floats on the water." In other words, beware of the transportation industry!

In the summer of 1931 a group of insurance companies and savings banks appeared before the Interstate Commerce Commission in the 15 percent case, and made this statement:

In view of these conditions, your petitioners deem it necessary to inform this commission, as a factor affecting the public interest, that, unless and until these conditions are corrected so as to improve the element of safety in railroad securities, they may not feel justified, in view of their obligations to their depositors or policy holders, in making further investments in railroad bonds.

Although there has recently been a sharp advance in railroad bonds from the ridiculously low prices recently recorded, available records do no indicate that savings banks and insurance companies increased their holdings in railroad securities. It is also safe to say that these institutions did not purchase steamship bonds, nor the securities of truck and bus operating companies.

Now this country, because of its great distances, dense population and diversity of commodities produced, is absolutely dependent upon transportation of the most efficient type, and surely in the next year or two we may all look forward to business regaining a volume commensurate, let us say, with that of 1925, or 1926, or 1927.

But an efficient transportation system requires a lot of capital, and here we are, conducting our transportation industry in such a manner that there is grave danger that the capital markets will be closed to it, that is to say, capital will only be obtainable on a speculative basis, at high interest rates, or with the promise of abnormal profit to compensate for the more than ordinary business risk.

Now the blame for this condition, unless something is done to correct it, will fall upon the shippers of this country, upon the Interstate Commerce Commission, and also upon the railroad executives themselves, because all of them together have disregarded some basic economic principles.

In the first place, transportation creates value, and therefore is entitled to a share of the wealth that it produces. Let us suppose two men go up into the mountain to prospect for gold, and they find valuable ore, and one man digs all day and the other man spends all day carrying the ore down the mountain on his back. In this primitive example we have industry and transportation creating value in the exact ratio of fifty-fifty. When you go a step farther, and consider that the man carrying the ore exchanges it for food and supplies, which he carries back to his partner at the mine, you have an example of

commerce in its simplest form—industry dependent upon transportation, and transportation dependent upon industry, and neither can live without the other. But to have five men waiting around for an opportunity to carry some of the ore, when the vein is only wide enough for one man to work, is uneconomic and represents waste, and sooner or later four of the men become a charge on the community.

Now it seems to me that in this day and generation "hitch-hiking" is getting to be almost a national trait, and the thumb signal almost a national emblem. We feel we are entitled to transportation, whether we can pay for it or not, and if we produce articles for which there is no home market, then someone must provide transportation below cost, so as to enable us to dump abroad. Even the Interstate Commerce Commission has fallen into this "hitch-hiking" idea, for in its decision in the 15 percent case it said:

The public is entitled to demand that no more shall be exacted from it than the services rendered are reasonably worth, and this right takes precedence even over the right of the carrier to a fair return on its investment when the two rights cannot stand together.

Applying the principle here laid down to the two men working on the mountain, it means that the man digging the ore has the right to have his products carried that takes precedence over the right of the carrier to a fair return for his day's labor. In other words, the carrier is the slave of the digger, and has no rights to a share of the wealth that he is helping to create.

This policy expressed with regard to the railroads means that the shipper has a lien on the property of the railroads that takes precedence over the lien of the bondholders and the rights of the stockholders to their own property. No wonder the savings banks and insurance companies may not make any further investments in railroad bonds, when it turns out that a first mortgage is not a first mortgage at all, but only a second lien!

The Fallacy of Too Much Transportation

It is often said that "this country cannot have too much cheap transportation," and yet there is no greater fallacy. In the first place those who make this statement are thinking of rates, not "over-all costs."

We are just passing through the worst economic depression this country has ever known. Millions of people are out of work, and hundreds of thousands would be actually starving, except for organized relief, both public and private, on a gigantic scale, and yet there has been no crop failure, no flood, nothing to create a shortage of food and nothing to interrupt its normal distribution. The trouble is that our economic structure has been so seriously deranged that a very large part of the population has temporarily lost its purchasing power, and those that have are afraid to put out any money for anything but the bare necessities. In other words, the low price of commodities has produced just the opposite of prosperity.

* Abstract of an address delivered before the annual convention of the Associated Traffic Clubs of America.

Now in the same way low freight rates, that is to say, rates below a fair return, or living wage for the transportation industry, do not make for prosperity any more than 5-cent cotton, ten-cent oats, or 25-cent wheat, for the simple reason that in this country probably no less than 20,000,000 people are directly or indirectly dependent upon one or other of the branches of the transportation industry. Also millions of people, in this country, directly or indirectly, through voluntary subscription or through taxation, have invested not less than \$50,000,000,000 in this country's transportation plant. If then there are more transportation facilities than there are commodities to be transported, and ruinous competition forces down rates to the point where there is not a living to be made, and the vast aggregate of capital becomes unremunerative, then the purchasing power of the country has been reduced to a point that far outweighs, in its economic effects, the benefits that the shipper expects to receive from freight rates below cost.

When the industrial traffic manager finds in his office the representatives of two railroads, two trucking companies, and an agent of the inland waterways, all of them soliciting the same ton of freight, let him think of the five men up on the mountain, and remember that the rate he pays must include the salaries of all these men, and a return on all the facilities they represent, or else they will, sooner or later, become a charge on the community by "going broke." Wasteful competition costs money, and somebody has got to pay the bill.

Rates a Burden on Industry

It is a common complaint "that existing high rates are a burden on commerce and tend to restrict traffic," but let us see just what this burden is.

The Interstate Commerce Commission made an elaborate study of the relation of cost of transportation by rail to the wholesale value of the commodities transported. These figures cover the years 1928 and 1930. The United States Bureau of Census made a study of the total value of goods available for trade for the year 1929. A study of these reports brings out the fact that the average value of the commodities carried by Class I railroads during these three years was in the neighborhood of \$68,000,000,000. For the same years the average freight revenue collected by Class I railroads was approximately \$4,620,000,000; thus for these three years the average railroad freight bill for the country was less than 7 percent of the wholesale value of the commodities transported.

To bring these figures up to date, let us take the 1,153,000,000 tons originated in 1930, which, according to the Commission, had a value of \$62,000,000,000, and reduce the tonnage volume by the 40 percent that the car movement has fallen off, and reduce the value of each ton by 21 percent, being the average drop in commodity values for the first six months of 1932, as compared to the average value for 1930.

This adjustment to present-day conditions indicates that the value of the commodities transported by Class I railroads for the year 1932 will turn out to have shrunk from \$62,000,000,000 to \$29,000,000,000, but meanwhile the railroads' freight revenues have dropped from \$4,200,000,000 to an annual rate of only \$2,400,000,000, which represents 8.2 percent of the value of the commodities transported. Thus, when the year 1932 is ended, you will find that, taken as a whole, you still have paid the railroads less than you tip a waiter or a taxi driver.

Probably few would agree that the freight rate in the particular commodities in which they are interested is fair, and no doubt there are many inequalities that

should be ironed out, but nevertheless the rate structure as a whole must produce a certain minimum sum, or else the railroads are face to face with bankruptcy.

In 1929 Class I railroads were in the best financial shape in their history. They had an earned surplus of \$5,000,000,000 reinvested in plant that had not been capitalized, and their working capital aggregated about \$650,000,000, but when we compare this figure with the working capital of industrial corporations, we find that the Standard Oil Company of New Jersey alone had over \$613,000,000 working capital, or nearly as much as all Class I railroads put together. Industries in a depression can live off their working capital, which the railroads with 97½ percent in plant and only 2½ percent working capital cannot do.

The Capital Structure of the Railroads

Many will say that the real trouble with the railroads is that they are over-capitalized, but that is not the case. However, their capital structure, it must be admitted, is not adapted to withstand a disastrous three-year depression, but for the capital structure of the railroads, the shippers of the country and our system of regulation, as practiced by the Interstate Commerce Commission, are largely to blame.

All railroad financing is under the jurisdiction of the Interstate Commerce Commission, and the Commission, as well as the shippers of the country, would have objected to the issuance of common stock to provide cash that was apparently not needed, and yet upon which a return had to be provided for in the rate structure.

To be sure, some railroads, with the approval of the Commission, did some financing with stock, among which may be mentioned the Pennsylvania, New York Central, Baltimore and Ohio and the Frisco, but when it came to the 15 percent case, the Commission apparently did not feel the railroad stockholders were entitled to much consideration, for in the decision it said:

We do not find that we are justified on this record to attempt, by a rate increase, to protect the margin of one and one-half times fixed charges set by the New York law. To provide so far as practicable that actual interest charges be met is justified.

So while the stockholder's money is accepted in the public interest to build up an adequate transportation system, when it comes to providing a return on the investment, the stockholder's equity may be wiped out.

The investment banker has been much criticised, and rightly so, for the reckless manner in which many foreign loans were floated in this country, and for the lack of care in investigating the soundness of some domestic issues, but it can be stated without fear of contradiction that the investment banker's reputation would have suffered, and the loss to his clientele would have been as great if, during the same period, he had confined himself entirely to the sale of those securities that were authorized and approved by the Interstate Commerce Commission.

As long as the Commission has absolute power over both railroad financing and railroad rates, it would seem to be their obligation, when they authorize the sale of stocks and bonds, to see to it that there is a reasonable basis of earnings for their support.

Capitalization of the Railroads Compared to Investment in Highways

Class I railroads of the United States represent about 240,000 miles. The investment, as of December, 1931, was about \$100,000 a mile, representing equipment, roadbed, terminals, etc., and this investment was capitalized at only about \$80,000 a mile.

Take the average quotation for all railroad bonds listed on the New York Stock Exchange at their lows

for last spring, namely 45.94 cents on the dollar, and the average quotation for all railroad stocks, both common and preferred, of \$12.94 per share, and applying these market values to the capitalization of Class I railroads, we find that the railroads, including equipment and terminals, were offered for sale by their frightened holders for less than \$25,000 a mile.

Now let us compare railroad capitalization with what it cost to produce other forms of transportation, such as highway transportation and inland waterways.

At today's prices, and making allowance for the distance from source of supply and other variable factors, a fair average cost of a concrete slab 20 feet wide and 6 inches thick is approximately \$20,000 a mile, not counting grading or drainage, and of course placing no value on the right of way. For 1923 the cost would have approximated \$32,000. Sections of such highways as the Lincoln Highway cost, including grading and draining, from \$64,000 to \$70,000 a mile.

These figures indicate the cost of rural highways, but when you come to the cost of super-highways within metropolitan areas, the cost is staggering—running up to millions of dollars a mile.

I lay stress on these expenditures of the taxpayer's money for super-highways because I believe if you add together all the money that has been expended by states and counties on rural highways, and the money that has been expended by cities, both large and small, for the accommodation of motor traffic, you will find that in the brief period since the war this country has expended a sum equivalent to the capitalization of Class I railroads, the result of one hundred years of their development.

The taxpayer's back is breaking under the burden of these expenditures, and the credit of the states and municipalities has been stretched to the utmost limit, and yet this country is still 70 percent to 75 percent dependent upon the railroads.

The Farmer in the Transportation Business

Farm relief has become a major campaign issue, various programs having been submitted by both parties, but nobody has suggested that perhaps one of the causes of the farmer's dilemma is that he has turned his back on his old friend, the railroad, and gone into the transportation business himself. It is at least significant that between 1920 and 1930 \$12,000,000,000 has been expended on rural highways, but during the same period farm values have dropped \$20,000,000,000.

The farmer has been led to believe that the construction of improved highways would reduce his cost of getting his product to market, but this saving in transportation cost has not stuck in the pocket of the farmer, but has been passed on to the consumer. The price of his wheat has gone down in competition with world markets, but he has been left with his concrete highway, and an increase of 250 percent in his taxes.

In addition, the farmer is paying tribute to the mining, manufacturing and oil industries to the tune of some \$1,000,000,000 a year for the operation of his fleet of over 5,000,000 trucks and pleasure cars.

The farmer wants a moratorium on his mortgage interest, but he should also ask for a moratorium on highway building, for these, apparently, have added little to the value of his farm.

The Frisco Running the Schools

In the beginning of this year the St. Louis-San Francisco asked the Reconstruction Finance Corporation for help in meeting its interest charges, but the Interstate

Commerce Commission objected, except on the condition that the Frisco submit to a major operation, claiming that the road was over-capitalized, being worth only some \$50,000 a mile, instead of the \$70,000 a mile represented by its outstanding stocks and bonds.

In its report the Commission made the following statement:

The situation with regard to the applicant's delinquent taxes is especially critical. These taxes, due the States of Alabama, Kansas and Missouri and subdivisions thereof, have been delinquent and subject to varying penalties since the latter part of December, 1931. The taxing authorities are urging the applicant to make payment and are threatening attachment proceedings if payment is not promptly made. * * * The applicant is the largest tax payer in many counties in which it owes taxes, and such counties are so dependent upon the payment of the applicant's taxes that, unless paid, the counties will not be able to take care of their obligations. Moreover, the operation of the schools in these counties is dependent upon the payment of these taxes, and, unless paid, the applicant is advised that it will be necessary to close them.

According to the United States Bureau of Public Roads, the program of total estimated expenditures on state and local roads for these three states for 1932 was as follows—Alabama \$8,791,000, Kansas \$17,350,000, Missouri \$52,906,000.

Apparently the St. Louis-San Francisco Railroad is expected to operate the schools while these states themselves are busy highway-building.

The automobile industry has accused the railroads of trying to put trucks and motor buses out of business, by urging increased taxation, but it seems to me that the whole problem reduces itself to one of simple economics, which can be expressed in the following sentence:

If the railroads can't pay any more taxes, and if the farmer can't pay any more taxes, if city real estate is assessed above its market value, and if the income tax has reached the point of the diminishing return, where then is some \$2,000,000,000 of highway money coming from each year, if not from the highway users themselves?

The Mirage of the Inland Waterway

Now let us turn for a minute to the mirage of the inland waterways. The inland waterway is the biggest hoax that is being perpetrated on the American people today. They are led to believe that water provides the cheapest form of transportation, but water transportation is only cheap when nature provides the waterway and maintains it free of charge. Where the waterway first has to be created, we run foul of hydraulic engineering, and nothing under the sun is more expensive than "to make water run up hill." It is not cheap to make an inland waterway out of a stream that nature intended to be navigable only for an Indian in his canoe.

To say anything against inland waterways is to lay yourself open to be branded as a railroad propagandist, but I am speaking from the point of view of "prudent investment," and shall use as a basis of my argument primarily the reports of the Inland Waterways Corporation, the State of New York Department of Public Works, and the government reports on the St. Lawrence waterways.

In the first place, the organization of the Federal Barge Line, for the purpose of demonstrating that barge lines could be successfully operated on the Mississippi River and its tributaries, is an insult to the enterprise and intelligence of the American people. The American people are a seafaring nation, and they can navigate anything that floats on any navigable waterway anywhere on the surface of the globe.

For the United States government, therefore, to organize the Inland Waterways Corporation, and turn it

over to the Army, to give the American people a lesson in barge operation, was a farce at the very start. It would at least have made more sense if it had been turned over to the Navy.

Its success may be judged by General Ashburn's report, at a Congressional hearing, when he denied that the Inland Waterways Corporation had lost money, and claimed that as a result of eight years of operation of the Corporation he had come out \$8,000 ahead.

I was surprised to read in the annual report of the Inland Waterways Corporation, for 1930, the following paragraph:

What located the great aluminum ore works at East St. Louis, Illinois, employing hundreds of men, and distributing its finished products all over the world? It was the cheap cost of transporting bauxite ore from the British Guianas by ship, thence up the Mississippi River by the Federal Barge Lines. This great plant would never have been located there unless the Federal Barge Lines had given a water rate sufficient for the company to compete with Baltimore rates.

I could not understand why a government agency, supported at the taxpayer's expense, should favor East St. Louis over Baltimore, and so I looked further into the matter of bauxite ore, and found, in the annual reports, that the Federal Barge Line's tonnage of this material, in round figures, was as follows:

Tons	1927	1928	1929	1930	1931
	244,000	343,000	136,000	.....	3,000

I was quite intrigued to find out what became of the bauxite ore, as I had not heard that the Aluminum Company of America had gone out of business, and so I wrote Mr. Davis, chairman of the board, and received the following reply:

The statement that the location of our alumina works at East St. Louis was influenced by river transportation is not correct. This plant was built years before bauxite was even discovered in South America.

We are now moving the bulk of our bauxite by rail from New Orleans, to which point it comes by steamer from South America.

In a recent hearing before the House Committee on appropriations, some figures were presented by General Ashburn, showing the operating costs of the Federal Barge Line for 1931, according to divisions.

The Lower Mississippi operations showed a profit of 52 cents a ton, the Warrior Division showed a loss of 31 cents a ton, and the Upper Mississippi Division showed a loss of \$3.40 a ton.

General Ashburn's figures, therefore, seem to demonstrate that it was possible for the Federal Barge Line to make a small profit, before interest and taxes, on that part of the Mississippi which has always been navigable, but it lost money on those inland waterways that first had to be artificially created.

Now supposing an Investment Banker organized a \$20,000,000 corporation, and sold securities to the public based on statements such as those that emanate from the head of the Federal Barge Line, and at the end of eight years it showed a total operating income of \$8,000, before interest and taxes, what would these securities be worth? Certainly they could hardly be classed as prudent investments.

The point I want to make is—Why should the government issue bonds and spend the taxpayer's money on projects that are unsound from their inception, and that would cause the private banker to fall foul of the "blue sky laws" of every state of the Union?

New York State Barge Canal

The New York State Barge Canal System is about 525 miles long, and the total outlay for all branches of the Barge Canal System was \$230,000,000, or about \$438,000 a mile. Of this expenditure \$150,000,000 was

made subsequent to 1903 in an attempt to revive the Erie Canal, and on these bonds the taxpayers of New York are paying interest.

The director of the budget of the State of New York reported the other day that interest, operating expenses and maintenance of the Canal cost the taxpayers over \$10,000,000 a year.

The old Canal records show the maximum tonnage handled was in the year 1872, when 6,673,000 tons were transported, or 80 per cent more than the greatest tonnage since the Canal was rebuilt.

It is no wonder, therefore, that Frederick Stuart Greene, superintendent of public works, should want to unload it on the government, for he says:

From this it is clear that the Barge Canal, at least during 1930, was from a tonnage standpoint 83.93 per cent national. It seems both logical and fair, therefore, to the taxpayers of the State of New York that the cost of operating this nationally used waterway should rest with the national government.

It appears that the attempt to revive the Erie Canal as an artery of commerce commensurate with what it was some fifty years ago has failed, and were it not for the "promise to pay" of New York State, the \$150,000,000 Canal bonds would be worthless.

St. Lawrence Waterways Project

The joint cost of the St. Lawrence project is said by some to represent some \$500,000,000, some estimate that before it is through it will represent close to \$1,000,000,000 for waterways and power combined. What its true cost will actually turn out to be will probably never be known, because this project represents a situation ideal to the heart of the politician. Here "over-all" costs can be juggled between the taxpayers of New York and the taxpayers of the United States, between the power consumers, and the shippers, to the confusion of all.

In a report of the United States Department of Commerce on "The Great Lakes-to-Ocean Waterways" appears the statement: "In the interest of national transportation this country should make the best possible use of the water transportation facilities which nature has provided."

Here it seems nature has failed to provide water transportation by some half billion dollars. As a matter of fact to control the St. Lawrence River by means of locks and dams will represent one of man's greatest battles against nature.

Another statement reads:

The great demand for a deep channel outlet to the sea has come from the Middle West, which must have foreign markets for continued prosperity. * * * Particular attention therefore, has been given to the potential movement of commodities in our import and export trade.

This document was written in 1926, before the enactment of our present Tariff Bills, which have been a powerful influence in restricting the export and import business of this country. Supposing these export and import figures, upon which this proposed expenditure is based, are not realized—what then?

In another report of the Department of Commerce on the "St. Lawrence Waterway Project," under date of December 27, 1926, appears the following statement:

With the completion of such a shipway as the St. Lawrence, the freight rates on grain to world markets would be substantially reduced and as a consequence the price levels of all grain in the Lakes transportation area would be increased accordingly. Much the same type of economic reaction would affect other commodities and industries. It has been estimated that the values in a single year to the farmers alone would equal the capital cost of the waterway.

If the statement here made by the Department of Commerce is sound, namely, that "the value in a single

year to the farmers alone would equal the capital cost" of the St. Lawrence Waterway, then why not make this a toll canal, and give the taxpayer a share of the new wealth that he has created? Why not make the St. Lawrence Waterway self-liquidating?

But what will actually happen, if this western wheat is exported at all, is that it will float down the St. Lawrence River, side by side with the Canadian wheat, and it will enter the world's markets in competition with the Canadian wheat, the Argentine wheat, the wheat from Australia, and the Russian wheat, and the controlling factor that will determine the price that the western farmer gets will be the law of "supply and demand," and the saving in transportation, if any, will be passed on to the consumer.

Chaos Because of Lack of Co-ordination

The root of the chaos that exists in our transportation industry today is the lack of co-ordination. The word "co-ordination" is probably more frequently used in discussing transportation problems than any other word, and yet how can you have co-ordination at the bottom when it does not exist at the top?

The Interstate Commerce Commission is running the railroads; the War Department is promoting the inland waterways; the Post Office Department is subsidizing the airplanes; the Department of Agriculture is developing the highways. The shipping board has charge of ocean and coastwise shipping. Not one of these governmental bureaus is responsible to the other, and the "left hand does not know what the right hand is doing."

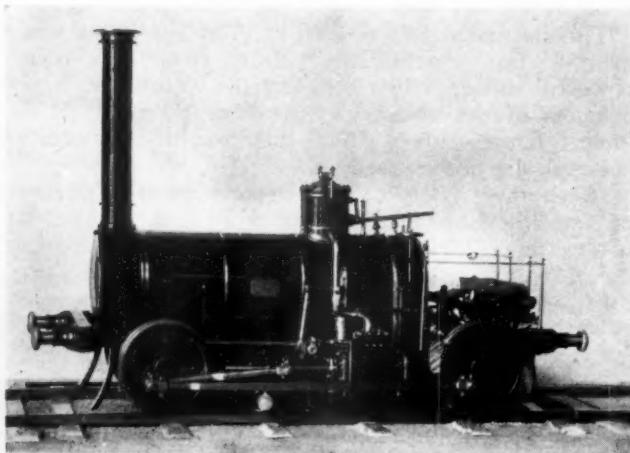
There has recently been enacted a bill authorizing the President to consolidate various governmental bureaus in accordance with their major purposes. The greatest thing that could happen to the transportation industry would be for the President to concentrate all the proper governmental functions that have to do with transportation into one organization, to be known as the Department of Transportation, and the policy of the Department should be "More sound information — less government regulation."

And on the Transportation Building should be inscribed the three words that you see on every public building in France:

Liberté—Égalité—Fraternité

which words, as they relate to the transportation industry, would stand for—Freedom for Individual Enterprise; Equality under the Law; and Co-operation, instead of ruinous competition.

* * *



Courtesy Railways Museum, Stockholm

A Model of the First Locomotive Used in Sweden Is Among the Exhibits in the Swedish Railways Museum at Stockholm

Pooling Orders Reduces Costs on D. & R. G. W.

THE Denver & Rio Grande Western has managed to effect substantial economies in its supply work, according to W. B. Hall, purchasing agent, by extending inventory periods, pooling small purchases to secure car-load shipments and studying stationery practices to reduce postage bills.

The stores department of this road, like those on all roads, is constantly confronted with the necessity of carrying some stocks of materials and supplies, which change little in volume from month to month. Such stocks include material commonly called "protective stocks," consisting of spare parts to guard against breakdowns of special equipment in use, and also extend to obsolete and second-hand material. Previous to the depression, it was customary to take an inventory of this stock each month, along with all the other stock work, but, after study, it was found that for the time being, at least, considerable expense could be avoided without any danger of shortage arising, by extending the inventory period for a selected list of items in the stores stocks to 90 days.

Assembles Small Orders in Car-Load Lots

Because of its remoteness from many manufacturing centers, the road is also confronted with a purchasing problem in which the cost of freight and the time element are unusually important factors. For a considerable period, according to Mr. Hall, the purchasing and stores departments co-ordinated closely to place the largest possible amount of purchasing in car-load quantities, in order to avoid the higher cost of handling l. c. l. shipments. With the reduced requirements for materials, less material is now being ordered in car-load lots, but the road has nevertheless succeeded in maintaining a large amount of car-load shipping by a pooling arrangement with certain manufacturers.

Under this practice, contracts are first made with the manufacturers on a quarterly, semi-annual or annual basis, which have the purpose of determining the supplier and fixing all conditions of purchase during the contract period except the quantity of material. As the requisitions for material are received, they are immediately sent to the contractor, with the understanding that the materials shall not be shipped immediately unless specified, but be held subject to shipment as called for. The practice is then to accept shipment whenever the manufacturer has enough material of different kinds on order to fill a car. This plan permits the manufacturer to proceed with the production of the material, thus avoiding delays to the railroad in meeting the consumption requirements, while it also becomes possible to make car-load shipments of various materials which were ordered in less-than-car-load quantities.

With the increase in postage rates, the road has also entered vigorously into a study of its stationery practices and, besides adopting standards for writing paper, envelopes, etc., that will afford savings in printing, is co-ordinating its mail work in a manner to effect a considerable saving in postage.

NEW YORK HEARINGS in connection with the Interstate Commerce Commission's investigation of terminal services (Ex-Parte No. 104, Part II) will open on November 14. The schedule calls for sessions extending over seven hearing days in that city.

Odds and Ends . . .

Bermuda Rail Transportation Paralyzed

Railroad service in Bermuda was brought to a complete standstill one day recently by a cow. It seems that the single train which operates between St. George and Hamilton struck the animal and was derailed, tying up the whole system for three hours.

Tribute to the Northern Pacific

Out in Starbuck, Minn., they still appreciate the Northern Pacific. Plans are being made to observe the 50th anniversary of the establishment of railroad service in that city. Starbuck is on the Little Falls-Morris branch of the railway which was built by the Little Falls & Dakota back in 1882. During November of that year, the first trains over the line were operated by the Northern Pacific.

Unusual Accident

Noting the item about odd accidents on this page in the October 1 issue of *Railway Age*, C. E. Rutledge of Cleveland, Ohio, sat down and wrote a story taken from his own experience. It happened some years ago when he was firing a locomotive on the Southern Pacific and working out of El Paso, Tex. He was working on a yard engine when the accident referred to occurred.

"The first coupling we made," writes Mr. Rutledge, "was to a box car. As we made the coupling, I saw the switchman at the front end stagger and hold his head. He had been hit by a knuckle pin. Some one, in trying to release a hand brake, had used the knuckle pin to make the dog or pawl release, and had left the pin balanced on the end of the car. When we coupled to the car, the pin fell and hit the switchman a glancing blow on the head. As I recall, he had to go to the hospital for treatment."

According to Orders

The "Railway Newsletter," published by the British Railways Press Bureau, tells the story of an elderly lady who had rather definite ideas of her own as to the way in which trains should be operated. In boarding her train she handed a one-shilling tip to one of the train employees and requested that he should "see that the driver did not rush his engine around curves or up inclines, that he kept it well oiled and the mechanism cool, and that he also kept a sharp look-out for signals." Apparently the laws she laid down were obeyed, for, at the completion of the 300-mile journey, the passenger sent her thanks "to the good driver and the management."

The "Newsletter" also tells a story of an inquiry which the railway received as to the charge which would be made for carrying a coffin, accompanied by its owner, in a passenger compartment. It appears that the passenger, while on a visit to the West Coast of England, found a "nice bit of wood" for his coffin, and that he had had the coffin made up, and now he wanted to return to his home and desired to have the coffin in the compartment with him to avoid the risk of its being scratched while in the baggage car.

Our Well-Traveled Make-Up Editor

Every now and then we run a story on this page about some individual or other who has traveled a great many thousand miles in the course of his regular duties. Here is such a story which concerns a member of our editorial staff. Our make-up editor, Gardner C. Hudson, first began to put the paper together on September 11, 1929, and on that day he made his first trip from New York to East Stroudsburg, Pa., where the *Railway Age* has been printed. From that time up to and including the last week in October, he made a total of 149 round

trips between New York and East Stroudsburg, with 16 round trips in 1929, 46 round trips in 1930 and again in 1931 and 41 round trips in 1932. The distance from Hoboken, N. J., to Stroudsburg being 82.6 miles, making 165.2 miles for each round trip, Mr. Hudson in the past 36 months has traveled 24,614.8 miles, or just about once around the world. In going back and forth, Mr. Hudson has used the Lackawanna, which has a round-trip rate from New York to Stroudsburg of \$5.37, so that the passenger revenue which the Lackawanna has enjoyed because of the necessity of weekly trips to Stroudsburg, on the part of our make-up editor, has been \$800.13. In addition to this, the railroad has received from \$300 to \$500 more in Pullman surcharges and in money spent in dining cars.

One of these days we are going to figure up how much money our foot-loose editorial staff spends for railway and Pullman tickets in the course of a year. We expect to surprise some of our railway friends with the knowledge of how good a customer of theirs the *Railway Age* is.

May Re-Enact Famous Locomotive Race

According to reports from Atlanta, Ga., there is a move on foot which may result in the re-enactment of the race between the "Texas" and the "General," two wood-burning locomotives, which was one of the livelier events of the early days of the Civil War. The "Texas" ran down the "General" on a rainy day in 1862 and postponed the collapse of the Confederacy, but Mayor Ed Bass of Chattanooga, where the "General" now stands on display, is said to be of the opinion that the "Texas" couldn't do it again. On the other hand, Mayor James L. Key, of Atlanta, where the "Texas" is now stored, is said to think that Mayor Bass is just being silly and that the "Texas" can outrun the "General" any day in the week. It is understood that the Georgia Public Service Commission has been asked for authority to re-enact the race from Big Shanty, Ga., to Ringgold, and it has been suggested that the drama be reproduced in detail, with the principals wearing the costumes of Civil War days.

The story of the race between the "Texas" and the "General" is familiar to many, but it is good enough to be worth repeating. Federal spies, so the story goes, stole the "General" as it stood under steam at a siding near Big Shanty. The engine crew were eating breakfast at a nearby tavern, and it was raining hard. The "General" was away before the Southerners missed it. Conductor Fuller, who was responsible for the locomotive, followed on a hand car until a twisted rail upset him. He then ran for several miles and finally commandeered an old freight engine and continued the chase after the "General," which was already laboring up the North Georgia hills toward Chattanooga. Conductor Fuller found the "Texas" on a siding several miles north of Etowah. It was facing south but he clambered aboard, shouted for volunteers, who swarmed over the engine, and headed north after the stolen "General." At times he is said to have run the "Texas" at a speed as high as 60 miles an hour, which was suicidal if not impossible. The Federal spies did all they could to stop the "Texas." They set box cars on fire and started them rolling back down the hills toward the "Texas," but Conductor Fuller, who was apparently a man of considerable resource, always managed to side-track the "Texas" in time to escape them. Finally, in desperation, the Federals set on fire the bridge at Chickamauga, which was a difficult task on account of the continued rain. The rails were slippery and the grade was heavy, but Conductor Fuller opened the throttle of the "Texas" and tore across the burning bridge. By this time the Federals seemed to realize that there was no stopping Conductor Fuller, so they set the "General" in reverse and started it back toward the "Texas," meanwhile fleeing into the nearby woods. Once more, had it not been for Conductor Fuller's quick-wittedness, there would have been a wreck. However, Fuller reversed the "Texas" in time to save it from collision with the "General." His men scattered after the Federal spies and captured all of them.

NEWS

A. R. A. Research Work To Be Broader in Scope

Divisions are directed to explore possibilities for study in new fields

Steps looking to a widening of the scope of its research and experimentation activities were taken at the annual fall meeting of the American Railway Association held November 11, in New York.

The A. R. A. directed its various divisions to make a survey of their activities and the possibilities of new fields of endeavor, with a view of recommending what further work can be undertaken in the interest of obtaining still greater safety, economy and efficiency in railroad operation. This action was taken on the recommendation of the board of directors.

"A study of railroad research for the past half century," said a report from the board of directors submitted to the meeting by President R. H. Aishton, "indicates that most individual railroads in their own laboratories have for many years carried on work of this character supplemented by the efforts of manufacturers and others. These individual activities have been coordinated through their own central organization, the American Railway Association, and the results made available to all the railroads.

"The American Railway Association is mainly a research organization functioning through its committees composed of specialists in their particular line of work. Such men are in daily touch with the practical and technical phases of work in the different fields of industry, and they bring to their work a fundamental and practical knowledge of the problems with which they deal. It would seem that they are in a better position, therefore, to contribute constructive ideas to the work at hand than could be secured by an independent body.

"The railroads, after intensive study and research work, in some instances lasting months and years, have dealt with more than 3,000 problems in which specifications, rules, and standards of importance have been adopted resulting in substantial financial benefits to the railroads.

"Efficiency of service and economy of operation are the acid tests of activities of this nature. No railroad service in the world exceeds or even equals the quality afforded in this country, and as to economy of operation, there has been a constant decrease in operating costs and a constant improvement in the character of the service afforded the public. These results

clearly indicate the progressive activity of the railroads in this field of sustained research."

Pending before these divisions at this time are hundreds of problems involving research and experimentation and covering a wide range of subjects. Among the more important subjects now being actively studied at this time and which the A. R. A. authorized to be continued during the coming year are: To determine what improvements can be made in the manufacture of steel rails and car wheels; whether the exhaustive air brake tests recently completed by the railroads show that any changes are necessary in present equipment, and, if so, what improvements should be made; further standardization in the construction of freight cars with a view to increasing their capacity but with a saving in weight of equipment; improvements in design of tank cars and tank car appliances and devices; standard specifications for draft gears, which is the mechanism back of the couplers on cars designed to absorb the shock caused by the starting and stopping of trains; methods of bringing about still further improvements in train signals and other means of communication on the railroads of this country; improvements in crating and packing all kinds of freight in order to reduce the amount of loss and damage to commodities in transit; modernization of terminals, shops and freight yards; standardization and disposition of obsolescent materials; chemical treatment of water; and, means of bringing about still greater safety to passengers and employees on trains and to the general public at railroad highway grade crossings.

Timber as an Engineering Material

Members of the American Society for Testing Materials resident in the New York metropolitan district will hold a dinner meeting at the Hotel Governor Clinton, New York City, on Thursday evening, November 17, to discuss timber as an engineering material. The speakers will include John V. Neubert, chief engineer maintenance of way, New York Central, and president of the American Railway Engineering Association, who will present the viewpoint of the railroads; E. J. Russell, president, American Institute of Architects, who will present the viewpoint of the architect; F. J. Carter, chief engineer, Southern Pine Association, who will present the viewpoint of the manufacturer, and Dr. Hermann von Schrenk, consulting timber engineer and chairman of the American Society for Testing Materials Committee on Timber, who will speak on the "Protection of Timber Against Deterioration."

Government Cost Five Times Rail Earnings

Was same in 1913—Change indicates trend in business and government, says S. O. Dunn

That the total earnings of our railways and the total expenditures of all our governments, which were about the same in 1913, are now such that the total expenditures of all our governments in 1932 will be almost five times as great as the total earnings of our railways, is indicative of the changes that have occurred in business and government within recent years, according to Samuel O. Dunn, editor of the *Railway Age*, and chairman of the Simons-Boardman Publishing Company in an address at the annual convention of the Association of Railroad Chief Surgeons at Chicago on November 1. "In 1913," Mr. Dunn said, "the total earning of our railways and the total expenditures of our local, state and national governments were each about \$3,000,000,000. In 1932, the total earnings of our railways will be back to what they were in 1913, while the total expenditures of our governments will be about \$15,000,000,000. The experience of the railways has been worse during the depression than that of most industries, but all industries are suffering, as the railways are, from the combined effects of terrific losses of earnings and terrific increases of taxes due to unwise, wasteful and grossly excessive government expenditures.

"Our national transportation problem is second in importance only to the problem of getting adequate reductions of government expenditures. The difficulty of solving the railroad problem has been greatly increased by the development of competing means of transportation by waterway, highway and airway which are aided by our national and state governments by subsidies and by exemption from such regulation as is applied to the railways. If, however, there ever was a time when the importance of the railroads to the economic welfare of the American people should be recognized, and constructive efforts made to solve the railroad problem, it is now, when we are confronted on every hand with evidence of the effects produced upon the entire industry and commerce of the country by the decline in railroad earning capacity. The service of the railways in handling the great bulk of our commerce will be as indispensable for many years to come as it has been in the past. That fact being indisputable, let us survey some of the consequences of the decline in railway earnings that has occurred during this depression.

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At York

"The operating expenses of the railways in 1929 were \$4,560,000,000. In 1932, they will be 45 per cent less than this, a decline of about \$2,052,000,000. How has this enormous reduction of operating expenses been effected? The reduction in the number of railway employees has been about 620,000, and in the total wages paid to them about \$1,325,000,000. The reduction in purchases of materials and fuel used in operation has been about \$730,000,000, and there has been a further reduction of about \$700,000,000 in purchases of equipment and materials formerly made from manufacturers for the purpose of improving railway properties and increasing the efficiency and economy of operation. Therefore, in 1932, as compared with 1929, the total reduction in the wages paid and the purchases made by the railways will exceed \$2,750,000,000.

"That is not all, however. In 1929, the railways earned almost \$1,275,000,000 net operating income, which they used for paying their fixed charges, dividends, etc. In 1932, their net operating income probably will be less than \$250,000,000, or an amount sufficient to pay only somewhat more than one-third of their fixed charges. In the first eight months of this year the railways paid \$198,000,000 in taxes, while they earned only \$152,000,000 of net operating income toward paying their fixed charges, although on account of the reduction of their net earnings most railways are having to borrow from the federal government to avoid receiverships.

"The reason for these tremendous declines in railway employment, wages, purchases and net return can be given in two figures. In 1929, the gross earnings of the railways were \$6,360,000,000, while in 1932, they will be only about \$3,200,000,000, which is only about equal, as I have already stated, to their gross earning in 1913.

"General business began to improve about two months ago. It seems reasonable to hope that it will continue to improve. The railway situation will improve with it. The vitally important question is—how much will the railways improve? Will they improve relatively as much as general business, and if not, what carriers are going to handle in future the traffic which could be most economically handled by rail? What industries are going to employ and pay the wages of railway men now out of work? What industries are going to buy the equipment, iron, steel, coal and other materials and supplies of which, in the past, the railways have been the purchasers?

"The railways can and will 'come back' if our national and state governments will give them a chance by withdrawing subsidies and applying comparable regulation to all carriers. If the railways, which have been such large employers and such large purchasers from the important basic industries of the country, are not able to come back, how far will it be possible for the other industries of the country to come back?"

N. Y. Club to Discuss Waterways

At the January 20 meeting of the New York Railroad Club (29 West Thirty-

ninth, 8 p. m.), Milton W. Harrison, president of The Security Owner's Association, will deliver an address on the subject of inland waterways, with particular reference to the New York State Barge Canal and the St. Lawrence Seaway project. Mr. Harrison has recently completed an extensive study of the inland waterways which is being circulated privately.

Wage Statistics for August

The compensation of railway employees for the month of August was \$120,470,667, according to the Interstate Commerce Commission's monthly compilation of railway wage statistics. This is lower than the figure for any previous month this year and represents a decrease of \$57,705,753 or 32.29 per cent, as compared with August, 1931. The total number of employees as of the middle of the month was 996,317, a decrease of 291,757 or 22.65 per cent, as compared with August last year.

New York Baggage Transfer Companies Merge

The Westcott Express Company, a subsidiary of the American Express Company, and the New York Transfer Company have been merged under the new title of the Baggage Transfer Corporation, it was announced by American Express Company on November 3. The merger follows a decision of the Public Service Commission of New York which on November 1 granted the companies' petition for a consolidation of their baggage transfer business in New York City.

Club Meetings

The New England Railroad Club will hold its next meeting at Hotel Statler, Boston, on Tuesday evening, November 15. (Postponed because of the election.) Ralph Hammond, road foreman of engines, New York, New Haven & Hartford, will speak on proper operation of the modern locomotive.

The Pacific Railway Club will hold its next meeting on Thursday evening, November 17, at the Palace Hotel, San Francisco. The discussion will be on fuel conservation; speakers, E. J. Sanders, (A. T. & S. F.), and R. S. Trogood, (S. P.).

Passenger Men Discuss Low Fares

Reduction in passenger fares as a means of stimulating business was discussed by members of the Western, Transcontinental and Southwestern passenger associations at a meeting at Chicago on November 3-4. The view prevailed among the majority of the passenger traffic officers in attendance that there should be a reduction in the present 3.6 cents per mile rate, a few favoring a rate as low as 2 cents a mile, although the opinion of the majority was that the rate should not be less than 3 cents. It was felt generally that a reduction in rates at the present time would probably result in a loss of revenue to the carriers, owing to economic conditions, and that for this reason six or nine months should be allowed to pass before the fares are reduced. Other subjects discussed involved special passenger business, such as the operation of special trains for football

games and the handling of traffic to A Century of Progress Exposition at Chicago.

Water-Competitive Canned Goods Rate Found Not Justified

The Interstate Commerce Commission, Division 2, has found "not justified" a reduction proposed by the Southern Pacific and Western Pacific in the freight rate on canned goods from Sacramento, Calif., to San Francisco and other points on San Francisco Bay from 12 to 10 cents per 100 lbs. to meet the competition of the water carriers on the Sacramento river. The commission expressed doubt as to whether the proposed reduced rates would yield the direct costs and said there is prospect of rate wars and reprisals on the part of the water lines. It found the rates so low as to be unreasonable.

Court Denies State Control Over Co-operative Truck Lines

The state of Minnesota has no power to control co-operative truck lines through the State Railroad and Warehouse commission. This is the decision of Judge Carroll A. Nye in the Clay County district court on November 7. The state sought an injunction restraining Fred Seaton from hauling for numerous co-operatives, claiming that he operated a common carrier business. Seaton declared, however, that he was acting under contract with the co-operatives and, therefore, was not bound by the state law governing common carriers. The Northern Pacific was an intervenor in the action.

Order for Joint Use of Terminal Facilities Denied

The Interstate Commerce Commission has dismissed a complaint filed by the Southern Pacific and the Los Angeles & Salt Lake alleging that they have been subjected to undue prejudice and disadvantage by the Los Angeles Junction since the acquisition of the stock of the latter by the Atchison, Topeka & Santa Fe; and has also denied their application for an order requiring the Los Angeles Junction to accord them joint use of its terminal facilities. The commission found the evidence not persuasive that the acquisition by the Santa Fe had resulted in substantial diversion of traffic from lines of complainants to those of the Santa Fe.

Southern Cuts Rates on Automobiles Accompanied by Passengers

A 20 per cent reduction, effective November 1, has been made by the Southern in the combination charge for transporting, in expedited freight service, automobiles accompanying rail passengers. Two tickets, instead of three, are now required for the transportation of an automobile, while two passengers will continue to be carried in passenger service, making a total of four tickets required for each shipment.

When two persons travel under this new arrangement, the Southern's announcement points out, the cost of transporting the automobile is the equivalent of two passenger fares, a charge which is con-

siderably less than the freight rate on automobiles.

The minimum charge for handling an automobile and two passengers is \$54 and the use of the automobile at stop-over points may be arranged by paying \$15 to cover the cost of loading and unloading at each such point. Automobiles may be sent ahead seven days before the departure of the accompanying passengers.

Barge-Rail Rates on Cotton Proposed

The American Barge Line Company has applied to the Interstate Commerce Commission for an order establishing rail-barge-rail freight rates on cotton from Arkansas to points in eastern states, including New England, on the basis of differentials ranging from 9 to 11 cents per 100 lb. below the all-rail rates and from Memphis to eastern points 10 cents under the rail rates. The Barge Company had been advised that the federal barge line had made an agreement with the south-western lines providing for differentials of two, three and five cents under the all-rail rates between Arkansas and New Orleans. The varying differentials are based on varying carload minima.

Blanket Authority for Truck-Competitive Reductions Denied

The Interstate Commerce Commission has again denied the application filed by F. L. Speiden and other railroad tariff-publishing agents for a general authorization to publish on one day's notice reduced point-to-point rates to compete with actual movement or certified tenders by motor vehicle carriers. The commission had previously denied one such application filed in an effort to obtain a method for expeditious handling of truck-competitive rates. Its second denial is of an amended application proposing that the commission issue such authorization on condition that it reserve authority to suspend the rates later.

Chicago Car Foremen's Election of Officers

At the regular November meeting of the Car Foremen's Association of Chicago, the following officers were elected for the ensuing year: President, M. E. Fitzgerald, general car inspector, C. & E. I., Danville, Ill.; first vice-president, W. J. Owen, chief interchange inspector, Peoria and Pekin Joint Car Inspection Bureau, Peoria, Ill.; second vice-president, F. L. Kartheiser, mechanical inspector, Chicago, Burlington & Quincy, Chicago; treasurer, C. J. Nelson, superintendent of interchange, The Chicago Car Interchange Bureau, Chicago (reelected); secretary, George K. Oliver, passenger car foreman, Chicago & Alton, Chicago (reelected).

Ward W. Adair to Retire

At a meeting of the board of managers of the Grand Central Railroad Branch of the New York Y. M. C. A., presided over by Chairman Harold S. Vandebilt, the executive secretary, Ward W. Adair, tendered his resignation to be effective as of January 1, 1933. By request of the managing board the effective date was set

forward six months to July 1, to give opportunity for securing a successor.

When his resignation takes effect Mr. Adair will be in his twenty-fifth year of service at the head of the Grand Central Railroad Y. M. C. A., which serves men employed by the New York Central, New York, New Haven & Hartford, the Railway Express Agency and affiliated services. He came to New York from the executive secretaryship of the St. Louis Railroad Association, which was the personal gift of Mrs. Helen Gould Shepard.

Mr. Adair has just completed forty years in the service of the Railroad Y. M. C. A.

After several months of angling trips in Maine, New Brunswick and Newfoundland next summer, Mr. Adair will be identified with a New York business house.

Reduced Coach Fares in Northwest

Railroad coach fares between important cities in the Northwest will be reduced approximately 50 per cent on December 1, in an effort to regain lost business. The lower fares, which will be based on mileage rates ranging from 1½ to 2 cents and which will be continued in effect until April 30, 1933, will be established between St. Paul-Minneapolis, Minn., and Duluth-Superior, Wis.; Seattle, Wash., and Tacoma; Seattle and Spokane; and Tacoma and Portland. Railroads participating in the move include the Chicago & North Western, the Chicago, Milwaukee, St. Paul & Pacific, the Minneapolis, St. Paul & Sault Ste. Marie, the Great Northern, the Northern Pacific and the Union Pacific.

Railroad Borrowings

Loans from the Reconstruction Corporation to railroads amounting to \$342,882,221 had been approved by the Interstate Commerce Commission up to October 31. Of this \$327,114,579 was for Class I railways. During the first ten months of this year the railways had also borrowed from other sources \$325,553,579, including \$203,289,720 on notes or other evidences of indebtedness for which commission authority was not required but for which notification must be filed with the commission, in addition to \$34,376,219 loaned by the Railroad Credit Corporation. In the same period the commission has approved security issues by railways amounting to \$1,095,233,739, of which the greater part represents bonds used for purposes of collateral.

Burlington Reduces Round Trip Suburban Fares at Chicago

Round-trip based on a rate of two cents a mile, with a minimum charge of 20 cents, will be placed in effect by the Chicago, Burlington & Quincy on December 10 between all suburban stations between Chicago and Aurora, Ill. Tickets will be on sale daily and will have a return limit of three days. In some instances the new schedule will effect a reduction in the regular round-trip fare amounting to 50 per cent or more. As an example, the present one-way fare between Chicago and LaGrange is 51 cents, while on the basis of the new schedule the round-trip between these points may be made for

55 cents. The low rates will be continued in effect for a six-months' test period and their continuation thereafter will depend on public response.

Central Vermont Extends "Vermont Rocket" Route to Montreal

The fast freight service of the "Vermont Rocket," which was inaugurated on July 4 by the Central Vermont, in conjunction with the Boston & Maine, has been extended through to Montreal. This train, which has been providing overnight service, coupled with store-door pick-up and delivery of merchandise freight, from Boston and other Massachusetts points to Vermont, has, during the first four months of its operation, the Central Vermont statement says, "completely justified its existence."

The extension to Montreal will provide overnight delivery in that city of merchandise freight from Boston and Springfield, Mass., and from New London and Willimantic, Conn. Second-day delivery in Montreal will be given on freight originating in New York.

Grain Dealers Disapprove Waterway Competition

"Opposition to the growth of governmental business activity, and, as a branch thereof, the building and financing of government-operated barge lines upon the navigable rivers of the United States" was expressed in a resolution adopted by the St. Joseph (Mo.) grain exchange on November 3. The stand was also taken in the resolution that, while government aid should properly be extended to the building of proper channels and river control, the establishment of inland waterway transportation systems should be left to the fields of private enterprise which might determine "upon its own financial responsibility the economic need of barge line service and the prospects of profitable returns therefor."

The resolution referred to the financial distress of the railroads and cited the opinion that any benefits which may be obtained by farmers from the operation of barge lines on the Missouri river will accrue regardless of whether the barges are operated under private control or by the government.

Water-Competitive Rates on Woodpulp Found Justified

The Interstate Commerce Commission, Division 4, in a decision made public on November 7, found justified reductions proposed by the railroads on woodpulp, in carloads, from Norfolk and other Virginia ports and north Atlantic ports to destinations in central territory to meet water and truck competition, which had been suspended since August 15. The report cites movements of woodpulp from Sweden by barge from New Orleans to Cincinnati and by truck from Cincinnati to Hamilton, Ohio, also movements through the St. Lawrence river to Toledo and by rail to Hamilton; and from the Pacific coast to Kalamazoo, Mich., through the Panama canal, ocean to New York, and the New York State Barge Canal and the Great

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Lakes to South Haven, Mich. The transcontinental lines had protested against the reductions on movements from the Pacific coast, on the ground that it would affect their overland rates from the same territory, but they did not object to the reductions in so far as they apply on imported woodpulp.

N. Y. C. Bus Competitor Denied New York Certificate

An application of the Eastern Greyhound Lines for authority to operate a bus route between Buffalo and a point five miles west of Canandaigua, N. Y., has been denied by the New York Public Service Commission. The application also asked authority to operate the proposed route into the city of Canandaigua as a part of the route now operated between Rochester and Syracuse, N. Y.

The proposed bus route would compete with the New York Central and also with portions of the Delaware, Lackawanna & Western, the Lehigh Valley and the Erie.

"The New York Central," the report says, "has been operating for many years between the points mentioned. Its rights, as the rights of a long established common carrier in the territory, should be carefully considered before a certificate of public convenience and necessity was granted to a new common carrier whose operations will be in direct competition with those of a carrier already in existence. If the New York Central as a carrier of many years standing does not provide for the reasonable needs of the traveling public, it should be ordered to do so."

P. R. R. Bureau of New Ideas

Five years' operation of the Pennsylvania's Bureau of New Ideas have produced more than 10,000 suggestions from employees of that road for improving the service and effecting economies and efficiencies in operation and methods, according to a recent report covering the five year period. Of all the suggestions submitted by employees during this period, 25.4 per cent have been adopted either in whole or in part. During the last three years one out of every three suggestions received was adopted.

The Bureau of New Ideas which was established by the Pennsylvania management on November 1, 1927, was described in detail in an article appearing in the *Railway Age* of May 21, page 865.

Suggestions have come from employees in all departments and from every section of the territory in which the Pennsylvania operates. The number of suggestions received each year remains about constant, but the number adopted has shown a steady increase. For instance, in 1928, out of 2,086 suggestions finally acted upon, 9.2 per cent were adopted; in 1929, out of 2,206 suggestions, 19 per cent were adopted; in 1930, out of 2,584 suggestions, 32.9 per cent were adopted; in 1931, out of 2,120 suggestions, 33.3 per cent were adopted. This year to date, out of 1,246 suggestions finally acted upon, 35 per cent have been adopted.

In addition to money awards and other forms of appropriate recognition for each suggestion adopted, "special" cash prizes have been awarded for each of the best

three suggestions adopted during each six months' period.

Car Service Division Report

As a result of a gradual reduction in recent years in the amount of rolling stock owned, the railroads of this country now have fewer freight cars and locomotives than at any time in the past decade, according to the annual report of the Car Service Division, American Railway Association.

"The reduction," said Mr. M. J. Gormley, chairman of the division, in submitting the report, "in ownership of freight cars and locomotives has been made possible by the modernization of existing railway equipment. This, together with the fact that the handling of freight traffic has been expedited and operating efficiency greatly improved in recent years, has resulted in a constant improvement of service to the public.

"Freight cars owned by the railroads of this country now total 2,141,647 cars, a reduction of 223,025 cars or 9.4 per cent compared with the number owned in 1925, when the ownership was the highest on record. The average capacity of freight cars today, however, is 47.07 tons, an increase of nearly two and one-half tons since 1925 and an increase of 3.71 tons in the past ten years.

"Ownership of locomotives on October 1, 1932, totaled 52,936, a reduction of 12,135 or 18.6 per cent compared with the number owned in 1924, which marked the highest number on record in any one year. At the same time, there has been an increase of 16.4 per cent in the tractive power of locomotives and for the ten year period, an increase of 19.4 per cent."

Regarding freight traffic this year, Mr. Gormley said:

"Due to the movement of crops and fuel, together with some greater stimulation in business activity, there has been an improvement in freight traffic this Fall compared with earlier months. Beginning with the week ended on August 6, when 496,033 cars were loaded with revenue freight, there was a steady increase up to the week ended on October 15, when 650,578 cars were loaded. This was an increase of 31.2 per cent compared with the week of August 6. In 1931 for the same period, there was an increase of only 5.9 per cent, and in 1930, an increase of only 8.9 per cent. For the same period in 1921, the increase was 22.7 per cent. These comparisons show there has been a greater percentage of increase for this period in 1932 than ordinarily occurred in previous years."

Expanded Scope for Shippers' Advisory Boards to Be Considered

Desirability of expanding the work and functions of the shippers' advisory boards in order to enable them better to meet rapidly changing conditions in the transportation field, will be considered at a conference in Chicago, on November 16 and 17, of the general chairmen and other representatives of the 13 shippers' advisory boards. The conference was called by Charles Donley, of Pittsburgh, Pa., chairman of the Allegheny Shippers' Advisory Board, after preliminary correspondence

with the other boards. Mr. Donley feels that constructive plans can be worked out whereby the functions of these Boards can be expanded and the proper sphere of their activity, under present conditions, outlined. He further feels that the railroads and shippers together can promote a more adequate, more efficient and more economical system of transportation.

Since the first shippers' advisory board was organized in 1922, additional boards have been formed so that they now cover the entire country, providing a common meeting ground between shippers and railroad representatives for the discussion, analysis and correction of service difficulties. Their part in the solution of the car shortage problem is generally recognized, and there has been a desire among members for an opportunity to discuss some of the new problems in board meetings. Executives of the American Railway Association will be present.

Program for 1932 A.S.M.E. Annual Meeting

The technical program for the annual meeting of the American Society of Mechanical Engineers, which is to be held December 5-8 at the Engineering Societies Building, 29 West Thirty-ninth street, New York, shows a number of papers of outstanding merit. The Management Division is sponsoring three sessions of its own and co-operating in two others, the sessions of particular interest covering surpluses, long-time planning, trade associations, industrial management, and a ten-year review of management progress. The Railroad Division is sponsoring two sessions and co-operating in a third. Other sessions deal with Machine Shop Practice, Power Test Public Hearing, Materials Handling, Industrial Power, Mechanical Springs, Lubrication Engineering, Boiler Feedwater Studies, etc. The series of talks given by Dr. S. Marion Tucker of the Polytechnic Institute of Brooklyn which has proved so popular for the past two years will be repeated at 8:30 a. m. on Tuesday, Wednesday and Thursday, December 6 to 8, inclusive. A partial outline of the program follows:

Monday, December 5-9 a. m.
Working Stress Symposium
Locomotives
Horsepower and Tractive Effort of Steam Locomotives (Locomotive Ratios), A. I. Lipetz
Progress Report of Railroad Division
Soaking Pits and Radiant Heat

2:30 p. m.
Working Stress Symposium
Factors Affecting Choice of Working Stresses for High Temperature Service, P. G. McVetty
Metals at High Temperature—Test Procedure and Analysis of Test Data, Ernest L. Robinson
Rolling of Metals
Special Design of Cars
Car Construction of the Future, C. E. Barba

Power-Test Public Hearing
Public Hearing on Test Code for Centrifugal Compressors, Exhausters and Fans
Pulsation in Air Flow from Fans and Its Effect on Test Procedure, H. F. Hagen
Influence of Bends in Inlet Ducts on the Performance of Induced-Draft Fans, L. S. Marks, J. Lomax and R. Ashton

Tuesday, December 6-9:30 a. m.
Working Stress Symposium
Allowable Working Stresses Under Impact, N. N. Davidenkoff
Suggestions on Choice of Working Stresses, C. R. Soderberg
Cutting Metals
Effect of Lathe Cutting Conditions on the Hardness of Carbon and Alloy Steels, T. G. Digges

Materials Handling on Railroads

Materials Handling as a Factor in the Transportation of Commodities, M. W. Potts and J. A. Cronin
Effects of Transportation Requirements on the Evolution of Railroad Equipment, C. B. Peck

Industrial Power

High-Pressure Steam-Generator Research, A. A. Potter, H. L. Solberg, G. A. Hawkins and P. A. Willis

2 p. m.

Cutting of Metals

What Can Be Accomplished with Modern Machine Tools and Cemented-Carbide Cutting Tools, A. A. Merry
Grinding Cemented-Tungsten and Tantalum Carbide Tipped Tools Efficiently and Economically, J. M. Highducheck

Mechanical Springs

Number of Active Coils in Helical Springs, R. F. Vogt
Three Progress Reports of Mechanical Springs Research Committee

Bearings

The Morgoil Roll-Neck Bearing, F. P. Dahlstrom
Strength of Roll Necks, W. Trinks and J. H. Hitchcock

Heat Transmission and Stokers

The Measurement of Metal Temperatures on the Heat-Receiving Side of Heat-Exchanging Apparatus, Arthur Williams
Stoker Development at Delray Power House No. 3, The Detroit Edison Company, Paul Thompson and Fred S. Chatel

8:30 p. m.

President's Night and Conferring of Honors

Wednesday, December 7—9:30 a. m.

Foundry

Special Steel for Castings, R. A. Bull
Malleable Iron as a Component Part of Machines and Structures, E. Touceda

Economics

Surpluses—Their Distribution
Long-Time Planning—For Individual Concerns
Trade Associations—Their Services
Flow Measurement and Hydraulic Design
Problems of Modern Pump and Turbine Design, Wilhelm Spannake

2 p. m.

Plant Management

The Economic Characteristics of the Manufacturing Industries, W. Rautenstrauch
The Dissolving of Concentrated Industries, Harold V. Coes
Management Essentials for Recovery, Carle M. Bigelow
Flow of Fluids
A Study of the Data on the Flow of Fluids in Pipes, Emory Kemler

6:30 p. m.

Annual Dinner, Hotel Astor

Thursday, December 8—9:30 a. m.

Aeronautics

Management Progress
Ten Years' Progress in Management, L. P. Alford
Applications of the Kmh. Method of Analyzing Manufacturing Operations, L. P. Alford and J. E. Hannum

Central-Station Power

Stresses in Boiler Tubes Subject to High Rates of Heat Absorption, Wm. L. DeBaufre
A System for Measurement of Steam with Flow Nozzles for Turbine Performance Tests, Sanford A. Moss and Wistar W. Johnson
Performance of Modern Steam-Generating Units, C. F. Hirshfeld and G. U. Moran

2 p. m.

Education and Training for the Industries
The Engineer's Interest in Foreman Training, Edward S. Cowdrick
Fundamentals of Training, G. Guy Via
Adult Technical Education, Ovid W. Eshbach
Lubrication Testing
Some Problems on the Lubrication of Vertical Journal Bearings, A. I. Ponomareff and E. D. Howe
Chemistry of Lubrication, W. F. Parish and Leon Cammen
Progress Report of Petroleum Division

Frisco Speeds Freight Schedules

Over 125 trainmen and enginemen have been returned to work, several freight trains have been reinstated and through freight-train schedules have been revised by the St. Louis-San Francisco as the result of an appreciable increase in business in recent weeks, which promises to continue. One of the purposes of the new schedules, which went into effect on October 30, is to give improved service from Texas and Florida points to the Middle

West, the new schedules providing for reductions amounting to as much as 17 hr. in the running time.

From Kansas City, Mo., to Birmingham, Ala., the running time of train No. 135 has been reduced 5½ hr. to 40½ hr., this train leaving Kansas City at 9:30 a.m. and arriving in Birmingham at 2:00 a.m. the second morning. Formerly this train left Kansas City at 7:00 a.m. and arrived at Birmingham at 5:00 a.m. the second morning. In the opposite direction the running time of train No. 134 has been reduced from 48½ to 33 hr., this train leaving Birmingham at 7:00 p.m. as formerly and arriving at Kansas City at 4:00 a.m. the second morning instead of at 7:30 p.m. on the same day. The running time of train No. 131 from Kansas City to Birmingham has been reduced 8 hr. 45 min. to 30 hr., this train now leaving Kansas City at 9:00 p.m. instead of at 7:15 p.m. and arriving at Birmingham at 3:00 a.m. the second morning instead of at 10:00 a.m. as formerly. Returning as No. 136, this train leaves Birmingham at 4:00 a.m. as formerly and gets into Kansas City at 11:59 a.m. the next day instead of at 5:00 a.m. the third day, a saving of 17 hr. as compared with the old schedule.

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS

Compiled from 160 reports (Form IBS) representing 164 steam railways, including 17 switching and terminal companies

TOTALS FOR THE UNITED STATES (ALL REGIONS) †

For the month of August	Income Items	For the eight months of
1932	1931	1932
\$28,567,755	\$56,593,045	\$153,491,886
14,350,915	16,572,289	133,876,924
42,918,670	73,165,334	172,037,286
11,144,115	11,211,524	287,368,810
44,833,369	43,949,476	527,331,390
2,146,792	2,011,833	87,976,923
58,124,276	57,172,833	88,349,165
<i>d</i> 15,205,606	15,992,501	356,091,025
		353,129,292
		17,193,522
		17,081,661
		461,261,470
		458,560,118
		68,771,272
		d 173,892,660
		192,335,690
		13,177,929
		37,256,076

BALANCE-SHEET ITEMS**Selected Asset Items**

	Balance at end of August	
	1932	1931
10. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	\$777,209,478	\$837,432,105
11. Cash	267,429,457	373,649,744
12. Demand loans and deposits	37,766,123	49,032,029
13. Time drafts and deposits	28,565,856	77,032,147
14. Special deposits	29,691,359	60,195,550
15. Loans and bills receivable	13,927,149	8,763,814
16. Traffic and car-service balances receivable	44,958,131	63,443,632
17. Net balance receivable from agents and conductors	38,876,309	52,093,756
18. Miscellaneous accounts receivable	148,936,270	170,665,048
19. Materials and supplies	338,120,860	397,447,493
20. Interest and dividends receivable	36,123,901	39,544,286
21. Rents receivable	2,789,764	4,805,658
22. Other current assets	7,539,353	12,705,127
23. Total current assets (Items 11 to 22)	994,724,532	1,309,378,284

Selected Liability Items

24. Funded debt maturing within six months*	90,143,934	77,192,357
25. Loans and bills payable	276,712,822	194,519,880
26. Traffic and car-service balances payable	61,568,712	89,666,668
27. Audited accounts and wages payable	195,873,065	266,156,179
28. Miscellaneous accounts payable	75,496,995	70,883,230
29. Interest matured unpaid	157,485,609	142,697,121
30. Dividends matured unpaid	4,720,344	18,478,773
31. Funded debt matured unpaid	50,616,564	41,888,550
32. Unmatured dividends declared	13,850,818	25,871,068
33. Unmatured interest accrued	112,501,860	113,749,272
34. Unmatured rents accrued	29,885,594	30,062,612
35. Other current liabilities	16,772,598	19,764,933
36. Total current liabilities (Items 25 to 35)	995,484,981	1,013,738,286

* Complete data for the following Class I railways not available for inclusion in these totals: Canadian National Lines in New England, Canadian Pacific Lines in Maine, and Canadian Pacific Lines in Vermont.

Includes payments which will become due on account of principal of long-term debt (other than that in Account 764. Funded debt matured unpaid) within six months after close of month of report.

d Deficit.

The improvement in service from Kansas City to Oklahoma City, Okla., has resulted in a saving of 5 hr. in elapsed time, the schedule now being on a 17½-hr. basis, while the schedule from St. Louis to Birmingham has been reduced 7½ hr. to 20 hr. In the opposite direction between the latter points the schedule has been shortened 6 hr. 40 min. to 31 hr. In most cases the improvement in service has been brought about by speeding up existing trains and adding slower trains to handle local business.

Net Deficit for Eight Months
\$173,892,660

Class I railways for the first eight months of this year had a net deficit of \$173,892,660 after deducting interest and rentals from the net railway operating income and other income, according to the Interstate Commerce Commission's monthly statement of selected income and balance-sheet items. For the corresponding period of last year they had a net income of \$68,771,272. For the month of August the net deficit was \$15,205,606, as compared with a net income of about that amount in August last year. The summary is given in the accompanying table.

THE P at the co of the ra bling of t for the 9 steel aut money pr loan" rec struction in the Re portant c struction They wil permit of into a sin possible, the loadi are bulky the ship carload ha been des ance li bridges. the cars, nent devi mobiles end of th loading in level cars will sible in v car five a These w cars eve number end door conve unloading airplanes the past draft gat ed em furnishe plants, h works, I quantitie work of

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Equipment and Supplies

FREIGHT CARS

THE PENNSYLVANIA has started work at the company's shops on the fabrication of the raw plates and shapes and assembling of the component parts is under way for the 925 new steel box cars and 360 steel automobile cars, to be built with money provided by the \$2,000,000 "work loan" recently authorized by the Reconstruction Finance Corporation, as reported in the *Railway Age* of October 15. Important changes will be made in the construction features of the automobile cars. They will be longer, higher and wider to permit of the loading of more automobiles into a single car than has heretofore been possible, and also to give more space for the loading of other commodities, which are bulky yet light in weight, thus giving the shipper full advantage of minimum carload rates. A new curved roof has been designed to avoid exceeding clearance limits of tunnels and overhead bridges. Another new feature in some of the cars, is the installation of a permanent device for raising and securing automobiles in an inclined position at each end of the car, this will permit also of the loading of additional automobiles standing level on the floor. As some of the new cars will be 50 ft. 6 in. long, it will be possible in this manner to load into a single car five automobiles of the smaller models. These will be the largest automobile box cars ever built by the Pennsylvania. A number of them will be equipped with end doors which will afford increased convenience and facility in the loading and unloading of automobiles, buses, trucks, airplanes, or other large units. During the past two weeks the doors, couplers, draft gears, brakes, castings and corrugated ends of these cars, which are being furnished by the supply and equipment plants, have been received at the Altoona works, Pitcairn shops and Enola shops in quantities sufficient to keep abreast of the work of the railroad shop forces.

SIGNALING

THE NORFOLK & WESTERN has petitioned the Interstate Commerce Commission for permission to discontinue the operation of automatic train control, as required by the commission's orders, on its line between Roanoke, Va., and Hagerstown, Md., 238.7 miles, and to operate locomotives equipped with cab signals instead. It is stated that the installation of the automatic train control cost \$750,898 and that operation and maintenance costs \$9,800 a year.

MISCELLANEOUS

THE CHICAGO, ROCK ISLAND & PACIFIC on November 7 recalled 250 shop employees for service at Shawnee, Okla.

Supply Trade

George B. Allison, supply manufacturers' representative, 50 Church street, New York, has been appointed representative in the eastern territory for the **Indestructo Glass Corporation**, Farmingdale, Long Island, N. Y., manufacturers of laminated glass.

George M. Sharer, who has been connected with the **Link-Belt Company** at Philadelphia, Pa., in various capacities for the past 32 years, has been appointed sales manager of its eastern division, with headquarters at Philadelphia. In this capacity, he has direct supervision of sales of all of the company's offices in the Atlantic Coast states.

As a result of the merger of the White Motor Company with the Studebaker Corporation, **James M. Cleary**, president of the S. P. A. Truck Corporation, South Bend, Ind., has been elected also president of the **White Company**, in which position he heads White sales activities. A. G. Bean continues as president of the parent White Motor Company, the manufacturing unit of the business, and George H. Kelly continues as president of the White Motor Securities Company and vice-president in charge of finance for the Studebaker, White and Pierce-Arrow companies. **T. R. Dahl**, vice-president and secretary of the White Motor Company and assistant to the president of the Studebaker Corporation, has been elected also president of the **White Motor Realty Company**.

Eugene H. Heald, general contracting manager of the **American Bridge Company** at Pittsburgh, Pa., has been officially designated to succeed to the title and responsibilities of **Arthur L. Davis**, vice-president in charge of sales, who died on October 19. Mr. Heald was born at Chicago and was graduated from the University of Wisconsin. He entered the steel business in the old Lassig plant of the American Bridge Company at Chicago and subsequently served as contracting manager in charge of the New Orleans, La., office which was formerly maintained at that place. He was then transferred in the same capacity to Richmond, Va., and when this latter office was closed he went to New York as a contracting manager. He was later transferred to Chicago as assistant division contracting manager for the western district and then was appointed division contracting manager with headquarters at Chicago. He remained in that position until about a year ago when he was transferred to Pittsburgh as assistant general contracting manager and later was appointed general contracting manager.

The **Warren Tool Corporation**, Warren, Ohio, has been organized to take over the business of the **Warren Tool & Forge Company**, by the bondholders' committee of the latter concern and will continue the forged steel hand-tool business and the malleable iron foundry which the Warren Tool & Forge Company has operated since 1912. **C. L. Schoonover**,

who has operated the business as agent for the bondholders' committee during the reorganization period has been appointed president and general manager of the new concern. **Howard C. Mull**, formerly vice-president in charge of railroad sales of the Warren Tool & Forge Company, has been appointed vice-president in charge of sales of the Warren Tool Corporation. **R. E. Gibson** has been elected treasurer and **Thorn Pendleton** has been elected secretary of the new company. The reorganized company will concentrate its manufacturing and sales activities on the "Devil" line of railroad track tools of special alloy steel, which the predecessor concern introduced to the industry in 1922, and also on the 150 styles and types of forged steel hand tools that were manufactured by the old company.

Mr. Schoonover was born on August 11, 1869, at Akron, Ohio, and after a high school and business college education he entered the employ of the Neracher Sprinkler Company at Warren, in 1892, as a bookkeeper. When this company was merged with the General Fire Extinguisher Company, Mr. Schoonover continued with the latter concern, holding the position of department cashier, superintendent of engineering and construction, assistant plant manager and plant manager in charge of



C. L. Schoonover

the pipe fabricating shop and fittings foundry. Mr. Schoonover resigned from the service of this company in August, 1925. In August, 1931, he was retained by the Midland Bank, Cleveland, Ohio, as trustee of the Warren Tool & Forge Company, and for 14 months he operated the business of that concern as agent for the trustee and receiver. Following the reorganization of the company he was made president and general manager of the Warren Tool Corporation.

Mr. Mull was born on July 13, 1888, at Cincinnati, Ohio, and entered railway service in 1909 in the engineering department of the Cleveland, Cincinnati, Chicago & St. Louis, being transferred to the operating department with headquarters at Cleveland in 1912. A year later he left railway service to enter the Chicago office of the Verona Tool Works, and from 1914 to 1916, he was a traveling representative for this company, being appointed Chicago sales agent at the end of this period. In 1918, Mr. Mull was placed in charge of

sales of the Verona Tool Works with offices at Pittsburgh and Chicago, which position he held until 1920, when he entered the service of the Reliance Manufacturing Company, being made manager of the railroad departments of this company and the Warren Tool & Forge Company on April 1, 1921. In October, 1922, he severed his connection with the Reliance Manufacturing Company to devote his time exclusively



Howard C. Mull

to the Warren Tool & Forge Company, being elected vice-president in charge of railroad sales in 1929. In June, 1931, he was appointed sales manager for the receiver, which position he held during the reorganization period and until his recent appointment as vice-president in charge of sales.

OBITUARY

J. J. Gilmore, who retired recently as Southern sales manager for the American Steel & Wire Company, Chicago, died at Birmingham, Ala., on October 24.

Construction

GULF & WEST TEXAS.—The Interstate Commerce Commission has indicated its willingness to authorize construction by this company (a subsidiary of the Southern Pacific) of a line extending from a connection with the Kerrville branch of the San Antonio & Aransas Pass (also a Southern Pacific subsidiary) near Fredericksburg Junction, Tex., north 28.6 miles to a connection at Fredericksburg with another new line previously authorized for construction by the Gulf & West Texas; unless the latter company shall be able to arrange for the purchase at commercial value of the existing 23.4-mile line of the Fredericksburg & Northern between Fredericksburg Junction and Fredericksburg. Commercial value of the F. & N., purchase of which has been recommended by the commission to avoid duplication of facilities, was fixed at \$200,000.

WESTERN MARYLAND.—This road has awarded to the Vang Construction Com-

pany, Pittsburgh, Pa., a contract for the construction of a highway underpass at Spring Gap, Md. The new structure, which is to be of concrete with a solid floor, is expected to cost about \$35,000.

Financial

ATCHISON, TOPEKA & SANTA FE.—Control of Subsidiaries.—The Interstate Commerce Commission has authorized control by this company of the Salina & Santa Fe, the Fresno Interurban and the Osage County & Santa Fe under modified leases.

CARLTON & COAST.—R. F. C. Loan.—The Interstate Commerce Commission has approved a loan of \$549,000 to this company from the Reconstruction Finance Corporation on its application for \$556,000 for the payment of matured first mortgage bonds, the purchase of 80 logging cars and one locomotive, and the construction of an extension of the 17-mile logging road of the Flora Logging Company, which it proposes to purchase.

CENTRAL OF NEW JERSEY.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$1,074,000 of general mortgage bonds.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—Abandonment.—Examiner R. R. Molster of the Interstate Commerce Commission has recommended in a proposed report denial of this company's application for authority to abandon its Fairmont branch, from Madelia, Minn., to Fairmont, 28.38 miles, saying that before this drastic step is taken every possible effort should be exerted to preserve the line by the fullest co-operation between the carrier and the people of the territory and that reduction in service should be tried for a reasonable period "in order to afford the people of the territory, now thoroughly aroused to the perils of the situation, an opportunity to restore to the branch all traffic possible to be routed thereto." The branch is paralleled by a state highway.

DELAWARE & HUDSON.—Notes.—The Interstate Commerce Commission has authorized this company to issue and reissue from time to time \$5,500,000 of promissory notes.

DENVER & RIO GRANDE WESTERN.—Stock Issue.—This company and the Denver & Salt Lake Western have applied to the Interstate Commerce Commission for authority for an issue by the latter company of \$3,850,000 of stock, the amount of the loan recently authorized by the Reconstruction Finance Corporation for the construction of the Dotsero cut-off. Interest during construction and 5 per cent dividends on the stock are to be guaranteed by both companies.

ERIE.—Bonds.—The Interstate Commerce Commission has authorized this company to pledge with the Railroad Credit Corporation \$2,600,000 of its refunding

and improvement 6 per cent bonds of 1932, now pledged with the R. C. C., and an additional \$1,400,000 of these bonds now in its treasury—this to secure a loan of \$630,000 advanced by the R. C. C. as security for future loans the road is authorized to pledge its equity in \$25,000,000 of bonds now pledged with the Reconstruction Finance Corporation.

GREAT NORTHERN.—Guaranty Payment Sustained.—The Supreme Court of the United States in a decision rendered on November 7 held that the federal government was not entitled to recover from this company \$1,329,785, with interest, representing the difference between the amounts paid under the six-months guaranty provision of the Transportation Act on Advance certificates issued by the Interstate Commerce Commission and the amount of the guaranty as later determined by the commission. The court held that the certificate issued by the commission under Section 212 of the act was binding upon the United States, that the later certificate for a smaller amount did not indicate a mistake but "merely a revision of judgment in respect of matters of opinion."

HOBOKEN MANUFACTURERS RAILROAD.—Notes.—The Interstate Commerce Commission has authorized this company to issue promissory notes for \$320,000 to provide funds for improvements.

LEHIGH & NEW ENGLAND.—Protest Against Consolidation Plan.—This company has petitioned the Interstate Commerce Commission to re-open and reconsider its consolidation plan, which, as recently modified, allocates the L. & N. E. to joint control by the four principal eastern systems proposed in the plan. The company objects to this plan, saying that the hearings were held during a period of abnormal economic depression and "under pressure from the executive branch of the Government," and that it prefers to remain independent.

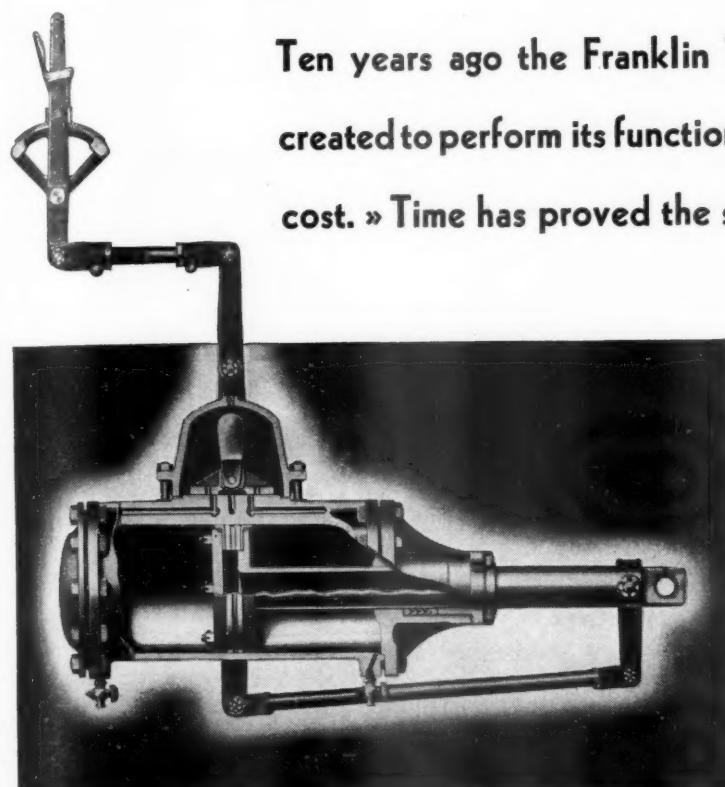
MISSOURI PACIFIC.—Abandonment.—The Interstate Commerce Commission has authorized this company to abandon a portion of a branch line between Barton Crossing, Ark., and Helena Crossing, 8.5 miles.

NEW ORLEANS GREAT NORTHERN.—Receivership.—This railroad was placed in receivership on November 7, by the United States district court at Jackson, Miss., and I. B. Tigrett, president, was named sole receiver. It had become evident that, in order to permit the company to continue to operate, a reorganization for the purpose of scaling down fixed charges would be necessary.

NEW YORK CENTRAL.—R. F. C. Work Loan.—The Reconstruction Finance Corporation on November 3 authorized the loan of \$2,500,000 to this company, to be used in furnishing employment by repairing freight cars, which had been approved on November 1 by the Interstate Commerce Commission.

NEW YORK CENTRAL.—I. C. C. Order Approving Leases Upheld.—The Supreme Court of the United States in a decision

USE A GEAR that time has tested



**FRANKLIN TYPE "E"
POWER REVERSE GEAR**

Specify Franklin Type "E"—the time-tested Power Reverse Gear that has proved its economy on thousands of locomotives.

DESIGN DETAILS

A balanced slide valve is used. Every air man is familiar with this type and understands the little maintenance required.

Crossheads and guides are eliminated, thus reducing weight, number of parts for stock and over-all dimensions.

The piston trunk and front head are proportioned to care for all side and vertical stresses at low unit bearing pressures. The self-adjusting piston rod packing requires no attention between shoppings.

The seal between the Rocker Arm and the Valve Chest is accomplished by a metallic joint. This is an advantage over soft packing.

FRANKLIN RAILWAY SUPPLY CO., INC.
NEW YORK CHICAGO MONTREAL

rendered on November 7 sustained the order of the Interstate Commerce Commission approving this company's lease of the properties of the Cleveland, Cincinnati, Chicago & St. Louis and the Michigan Central, which had been attacked by the New York Securities Corporation, representing certain minority stockholders.

NEW YORK CENTRAL.—*Acquisition of Chicago, Attica & Southern.*—The Interstate Commerce Commission has issued a report finding that the acquisition by this company of the property of the Chicago, Attica & Southern at a "commercial value" of \$165,000 will be in the public interest and authorizing the payment of that amount. This is one of the lines which the commission required the New York Central to offer to acquire as one of the conditions of its authorization of the lease of the Cleveland, Cincinnati, Chicago & St. Louis and the Michigan Central. A board of arbitration found the commercial value to be \$362,500. The N. Y. C. then applied for authority to acquire the property for not more than that amount but contended that the sum was too high and asked to be released from the condition. The commission reduced the figure to \$165,000. Commissioner Mahaffie, dissenting, said that there is no reasonable support in the record for a finding that the Attica can be made self-supporting and that it would be a burden on the New York Central and on interstate commerce. Commissioners Eastman, Brainerd and Lee concurred in this expression. The commission found that it would cost \$1,150,000 to rehabilitate the property, whereas the New York Central had estimated the cost at \$1,347,780.

NORFOLK & WESTERN.—*I. C. C. Accounting Order Upheld.*—The Supreme Court of the United States in a decision rendered on November 7 sustained the validity of an order of the Interstate Commerce Commission requiring this company to carry certain coal-mine properties on its books as "miscellaneous physical property" instead of transferring it to the road and equipment account. The court said that plainly the commission must, under the authority conferred on it by Congress, draw a line between carrier and non-carrier property. The court added, however, that the present order is one touching accounting merely, and that "before any rate base can be ascertained or any basis of recapture determined the carrier will be entitled to a full hearing as to what property shall be included; and not until the commission excludes the assets in question from the calculation may the carrier assert the infliction of injury to its rights of property."

ST. LOUIS-KANSAS CITY SHORT LINE.—*R. F. C. Loan.*—This company, incorporated in 1924 to build a new railroad between St. Louis and Kansas City, Mo., 236 miles, has applied to the Reconstruction Finance Corporation and the Interstate Commerce Commission for a loan of \$35,000,000 to build the line, stating it would give employment to 20,000 men for two years. The application signed by George R. Collins, of Kansas City, secretary, says

that \$265,000 has been expended for right of way.

TEXAS & NEW ORLEANS.—*Abandonment.*—Examiner Thomas F. Sullivan of the Interstate Commerce Commission has recommended, in a proposed report, that the commission authorize the abandonment by this company and the Houston & Texas Central of a branch line from Nelliva Junction, Tex., to Mexia Junction, 94.1 miles.

TOWNSVILLE.—*R. F. C. Loan.*—The Interstate Commerce Commission has approved a loan of \$32,000 to this company from the Reconstruction Finance Corporation.

VICKSBURG BRIDGE & TERMINAL COMPANY.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of \$4,000,000 to liquidate its bonded indebtedness and to replace a timber trestle with a steel trestle.

WHEELING & LAKE ERIE.—*Control.*—The Interstate Commerce Commission has denied the application of the Pittsburgh & West Virginia for authority to control this property by purchase of capital stock.

WOODSTOCK.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its entire line of railroad, 13.7 miles, extending from White River Junction, Vt., to Woodstock.

Average Prices of Stocks and of Bonds

	Nov. 9	Last week	Last year
Average price of 20 representative railway stocks..	23.80	23.30	49.14
Average price of 20 representative railway bonds..	59.01	60.03	78.56

Dividends Declared

Catawissa R. R.—Preferred, \$1.13, semi-annually, payable November 22 to holders of record November 11.

Cleveland & Pittsburgh—Special Guaranteed—50c, quarterly, payable December 1 to holders of record November 11.

Cuba Railroad—6 Per Cent Preferred dividend omitted.

Northern R. R. of New Jersey—4 Per Cent Guaranteed, 1 per cent, quarterly, payable December 1 to holders of record November 19.

Piedmont & Northern—Common dividend omitted.

Pittsburgh, Bessemer & Lake Erie—Preferred, \$1.50, semi-annually, payable December 1 to holders of record November 15.

Richmond, Fredericksburg & Potomac—7 Per Cent Guaranteed, \$3.50, semi-annually; 6 Per Cent Guaranteed, \$3.00, both payable November 1 to holders of record October 31.

West Jersey & Seashore—6 Per Cent Special Guaranteed, 1½ per cent, semi-annually, payable December 1 to holders of record November 15.

MORE POWER TO YOUR DOLLAR.—This is the title of a 24-page illustrated booklet describing Pyranol-Treated Capacitors manufactured by the General Electric Company, Schenectady, N. Y. A variety of capacitors is shown together with suitable housings which are adapted to a wide range of applications for both large and small installations. A section of the booklet gives in detail methods used in calculating capacitor sizes and numerous curves are included which show the gain in efficiency by the use of capacitors. The booklet is designated as GEA-77E.

Railway Officers

EXECUTIVE

As reported in the *Railway Age* of November 5, page 662, R. L. Burnap, traffic vice-president of the Canadian National, has been appointed executive assistant in connection with lines in the United States, with headquarters at Chicago; and Alistair Fraser, assistant general counsel, has been appointed to succeed Mr. Burnap as acting vice-president in charge of traffic.

Mr. Burnap was born at Burlington, Vt., on September 20, 1872, and received his education at Dartmouth College, from which he was graduated in 1894. He entered railroad service on October 15, 1894, as a clerk in the office of the station agent



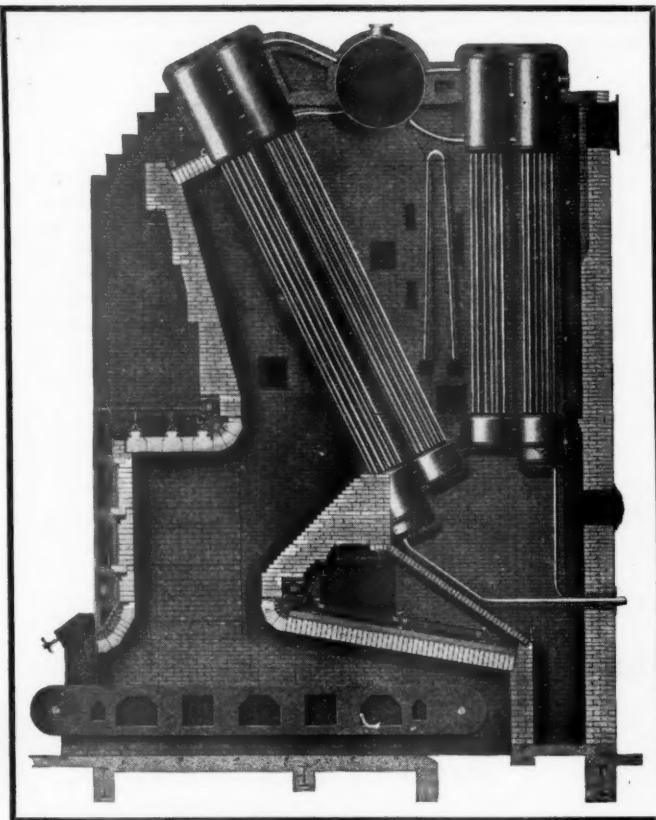
R. L. Burnap

of the Central Vermont at Ogdensburg, N. Y., and the following year he became associated with the freight traffic department. In 1896, Mr. Burnap went to New York to join the freight traffic department there and during the same year he was appointed traveling freight agent at New London, Conn. In February, 1900, Mr. Burnap became commercial agent for the Central Vermont, and also agent of the National Despatch Fast Freight Line at New York. Five years later he moved to St. Albans, Vt., as general freight agent, Central Vermont. He became assistant general freight agent of the Grand Trunk at Chicago in April, 1908; assistant freight traffic manager in 1911; traffic manager in 1919, and freight traffic manager of that road in 1920. In November, 1927, Mr. Burnap was appointed assistant general freight traffic manager of the Canadian National, with headquarters at Montreal, and freight traffic manager of the Central Vermont. Since January 1, 1930, he has been traffic vice-president at Montreal.

Mr. Fraser, who has been appointed acting traffic vice-president, was born at New Glasgow, N. S. He was admitted to the bar in 1911, and in 1921, he was appointed King's Counsel. Mr. Fraser be-

Continued on next left-hand page

THERE'S MORE TO SECURITY
ARCHES THAN JUST BRICK



Modern installation of chain grate stoker with American suspended arches and American sectionally supported air cooled front and side walls designed for burning lowest grade anthracite screenings.

INDUSTRY, TOO, Has Its ARCH Problems

American Arch Company's reputation as combustion specialists has spread thru all industry.

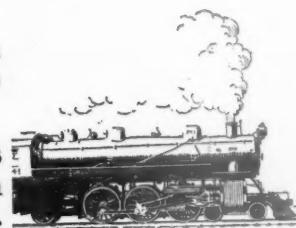
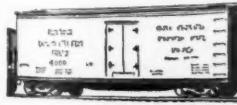
Heating furnaces in the country's greatest steel plants have roofs designed by American Arch Company experts.

Oil still arches and air-cooled side walls by American Arch Company are used in the leading oil refineries. The largest units in the world are so equipped.

Boiler furnaces have turned to American Arch Company for air-cooled side walls and arches, including the biggest units of any railroad power plant.

Everywhere throughout industry combustion problems of this nature are being brought to American Arch Company.

Meanwhile the railroads are still getting this counsel as part of the complete service on Arch Brick that is rendered by American Arch Company.



AMERICAN ARCH COMPANY

INCORPORATED

NEW YORK

CHICAGO

came general solicitor of the Canadian National in 1919, and in 1923 he became



Alistair Fraser

commission counsel. In 1929, he was promoted to assistant general counsel.

FINANCIAL, LEGAL AND ACCOUNTING

H. N. LaDow, assistant auditor of the Oregon-Washington Railroad & Navigation Company, has been promoted to auditor, with headquarters at Portland, Ore., to succeed **F. W. Sercombe**, who has retired.

John G. Lonsdale, president of the Mercantile-Commerce Bank & Trust Co., St. Louis, Mo., has been appointed co-receiver for the St. Louis-San Francisco by Federal Judge C. B. Faries to serve with **J. M. Kurn**, president of the Frisco, whose appointment as receiver was noted in the *Railway Age* of November 5. Mr. Lonsdale will have supervision over all matters other than actual operations, which will remain under the control of Mr. Kurn. **E. T. Miller**, vice-president and general solicitor, with headquarters at St. Louis, has been appointed general counsel for the receivers. **L. O. Williams**, secretary and treasurer, has been appointed treasurer, and **E. H. Bunnell**, comptroller, has been appointed chief accounting officer.

OPERATING

H. L. Worman, vice-president in charge of operations of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., has been appointed chief operating officer under the receiver.

T. Hope, assistant superintendent on the Canadian Pacific, with headquarters at Saskatoon, Sask., has been promoted to superintendent of the Moose Jaw division, with headquarters at Moose Jaw, Sask., succeeding **J. A. MacGregor**.

I. L. Boomer, who has been appointed superintendent of transportation of the British Columbia district of the Canadian National, with headquarters at Vancouver, B. C., as noted in the *Railway Age* of October 8, has a record of 40 years of rail-

way service, 38 of which have been with the Canadian National. Mr. Boomer was born in Nova Scotia on June 10, 1875, and after a public school education he entered railway service on March 5, 1891, with the Intercolonial (now part of the Canadian National), serving this road for ten years as a telegraph operator, agent and train despatcher. At the end of this period he resigned to become a trainmaster on the Sydney & Louisburg, with which road he remained for two years, when he returned to the Canadian National as a train despatcher. During the next 28 years Mr. Boomer was advanced through the positions of trainmaster, chief train despatcher, assistant division superintendent, inspector of transportation, division superintendent and assistant to the general superintendent of transportation, serving in these positions at Montreal, Que., Toronto, Ont., and other points. Mr. Boomer was holding the latter position, with headquarters at Winnipeg, Man., at the time of his recent appointment as superintendent of transportation of the British Columbia district.

has been given the title of chief purchasing officer under the receiver.

H. G. Devine, who has been appointed purchasing agent of the St. Louis Southwestern, with headquarters at St. Louis, Mo., has been in the service of several southwestern railroads continuously for 33 years. He was born on November 6, 1883, at St. Louis, and entered railway service in May, 1899, with the Missouri Pacific as a clerk and assistant timekeeper in the general foreman's office at St. Louis, being transferred to the storekeeper's office at that point two years later. In 1903, Mr.



H. G. Devine

TRAFFIC

J. R. Koontz, vice-president in charge of traffic of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., has been appointed chief traffic officer under the receiver.

ENGINEERING AND SIGNALING

E. G. Evans, right of way engineer of the Atlantic region of the Canadian National, will retire from active service after having spent 48 years in engineering work the greater part of which has been in connection with railways in the province of New Brunswick. He was born at Margate, P. E. I., in 1865, and studied engineering at Mount Allison University at Sackville, N. B., and at Boston, Mass. In 1885, he returned to New Brunswick and assisted in the surveys of the old Northern & Western (now part of the C. N. R.). Mr. Evans was also engaged in the construction of the Central of New Brunswick (now the New Brunswick Coal & Railway Company), and was connected with the Moncton & Buctouche and the St. Martin's Railway, both of which now are included in the Atlantic region of the Canadian National. On the incorporation of the Moncton & Buctouche into the government system in 1918, Mr. Evans transferred to the Canadian Government railways as district engineer. In 1925, he was appointed engineer of right of way for the Atlantic region of the C. N. R., which position he held until his retirement.

PURCHASES AND STORES

B. T. Wood, vice-president and chief purchasing officer of the St. Louis-San Francisco, with headquarters at St. Louis,

Devine was appointed M. C. B. billing and voucher clerk in the master mechanic's office at St. Louis, which position he held until 1905, when he went with the St. Louis-San Francisco as payroll and voucher clerk in the office of the auditor of disbursements, with the same headquarters. A year later he returned to the service of the Missouri Pacific and held various positions in the purchasing department until 1912, when he was made assistant chief clerk in that department, being advanced to chief clerk in 1916. In 1920, Mr. Devine left the Missouri Pacific to enter the service of the St. Louis Southwestern as chief clerk in the purchasing department at St. Louis. Four years later he was promoted to assistant purchasing officer, which position he held until his recent appointment as purchasing agent, effective October 17.

OBITUARY

S. L. Oliver, general agent for the St. Louis-San Francisco, with headquarters at Memphis, Tenn., died on October 11, at Los Angeles, Cal.

C. W. Price, assistant general passenger agent of the Oregon Short Line, with headquarters at Salt Lake City, Utah, died at that place on November 1, following an operation.

Carl J. Ernst, who retired on May 1 as assistant treasurer and assistant secretary of the Chicago, Burlington & Quincy, with headquarters at Omaha, Neb., died at his home at that place on November 2, at the age of 78 years.

Revenues and Expenses of Railways

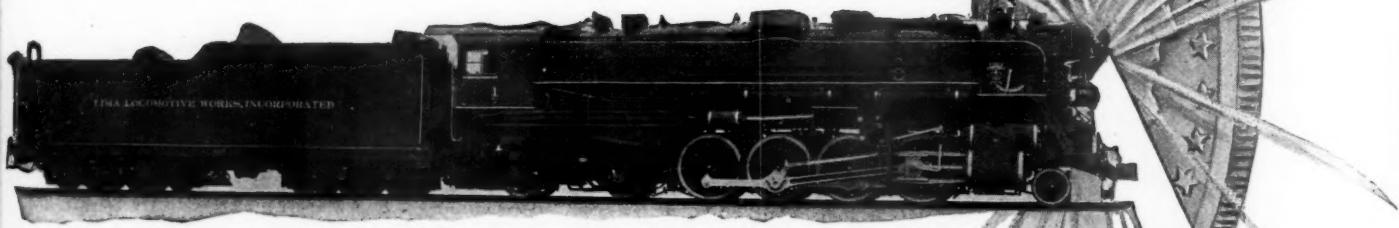
MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1932

Name of road	Av. mileage operated during period		Operating revenues—		Maintenance of equipment		Transportation		General		Total		Operating ratio		Operating income		Net ry. operating income, 1931	
	Freight	Passenger (inc. misc.)	Total	Traffic	Way and structures	Equipment	General	Total	Operating	ratio	Operating	income	Operating	ratio	Operating	income	Operating	income
Akron, Canton & Youngstown	Sept. 171	\$122,891	\$60	\$128,136	\$19,907	\$14,939	\$9,925	\$92,015	71.8	\$36,121	\$24,806	\$16,726	\$12,827	\$21,152	\$16,726	\$12,827	\$12,827	
Alton	Sept. 978	1,121,619	493	1,182,962	149,454	131,910	96,415	825,172	69.8	357,790	250,000	163,457	25,823	130,985	162,062	130,985	25,823	
Alton & Southern	Sept. 1,008	2,725	150,546	1,198,633	143,623	125,780	51,463	44,022	828,442	69.1	370,911	1,451,862	1,451,862	177,990	417,693	177,990	417,693	
Atchison, Topeka & Santa Fe	Sept. 9725	7,900,074	1,584,595	10,671,188	1,320,675	1,350,512	570,006	4,418,970	445,298	8,233,333	77.2	2,437,855	1,451,862	1,451,862	20,642	18,442	20,642	
Gulf, Colorado & Santa Fe	Sept. 31	9,725	7,499,455	1,045,031	9,304,177	1,108,751	1,99,294	315,268	43,916	45,224	57.94	32,826	26,996	1,75,213	15,176	18,442	18,442	
Panhandle & Santa Fe	Sept. 9724	64,455,915	10,802,025	82,361,020	9,479,357	20,283,997	3,071,442	2,444,546	3,530,902	63,749,077	77.4	18,611,943	9,949,331	9,949,331	10,781,170	20,948,896	10,781,170	20,948,896
Atlanta & West Point	Sept. 93	845,338	15,948	115,407	16,890	22,808	7,344	49,611	7,589	106,444	92.2	8,963	-1,342	-136,168	-44,658	-108,044	-108,044	
Western of Alabama	Sept. 133	645,051	17,445	97,832	10,216,063	12,765	2,469,631	85,157	37,76,408	657,677	842.4	1,629,794	249,966	-72,023	969,604	969,604	969,604	
Atlanta, Birmingham & Coast	Sept. 93	1,166,063	1,642,216	1,7416	186,991	42,413	56,213	20,330	86,322	15,594	231,299	127.8	-50,308	-62,392	-65,500	-64,225	-64,225	
Atlantic Coast Line	Sept. 5144	1,169,784	203,119	2,211,839	43,737,579	540,629	1,78,729	197,374	878,914	152,988	2,333,612	125.6	-469,123	-600,056	-688,505	-687,272	-687,272	
Baltimore & Ohio	Sept. 5144	22,134,430	3,888,021	29,013,698	4,573,579	549,779	1,78,729	1,78,729	455,507	87,180	1,02,247	98.2	-1,914	-8,657	-27,742	-5,646	-5,646	
Baltimore & Ohio	Sept. 5144	29,165,278	8,176,536	94,519,333	8,041,956	17,063,812	1,144,081	11,44,081	1,144,081	2,480,453	25,129,768	86.6	3,883,930	427,809	-203,519	-155,153	-155,153	
Baltimore & Ohio Chic. Term	Sept. 85	"	"	"	266,628	32,729	5,152	1,603	14,733	14,733	322,602	121.4	64,967	30,222	117,339	64,627	64,627	
Staten Island Rapid Transit	Sept. 23	43,369	96,126	147,669	2,40,159	231,384	330,387	16,710	1,281,737	148,297	2,066,960	86.0	335,199	-7,451	760,024	641,627	641,627	
Bangor & Aroostook	Sept. 53	407,547	892,122	1,367,970	73,482	113,649	13,078	1,76,253	1,76,253	1,26,600	111,721	75.7	35,948	-17,948	846	219,07	219,07	
Belt Ry. Co. of Chicago	Sept. 53	"	"	"	2,916,341	199,642	288,991	21,724	729,382	124,346	1,060,083	77.5	307,887	142,962	4,858	142,461	142,461	
Bessinger & Lake Erie	Sept. 619	233,731	11,703	265,810	97,557	91,783	4,363	101,557	223,316	223,316	322,602	121.4	56,792	30,222	117,339	53,848	53,848	
Boston & Maine	Sept. 226	376,199	986	383,645	68,115	1,39,190	103,061	988,787	14,733	1,281,737	148,297	2,066,960	86.0	335,199	-7,451	760,024	641,627	641,627
Cambria & Indiana	Sept. 2,091	2,451,461	656,108	3,691,931	455,419	51,479	41,472	1,119,363	223,316	3,069,104	223,316	3,069,104	65.4	1,622,644	-1,229,128	1,198,574	963,764	963,764
Brooklyn Eastern Dist. Term.	Sept. 11	651,109	"	"	80,367	3,722	1,20	101,557	1,01,557	1,01,557	3,64,070	3,339,886	123.7	-639,574	-844,373	-840,368	1,588,554	1,588,554
Burlington-Rock Island	Sept. 310	58,285	1,348	651,977	40,916	81,356	1,760	205,087	54,394	1,75,541	1,75,541	2,566,307	66.0	1,23,317	-1,04,317	1,154,334	70,137	70,137
Canadian Pac. Lines in Maine	Sept. 1,057,173	22,405,345	6,387,769	34,274,334	4,554,513	5,196,869	662,548	13,098,178	1,67,671	25,284,592	73.8	861,932	861,932	465,031	932,479	95,663	95,663	
Central New Jersey	Sept. 85	508,959	139,125	818,719	1,64,143	12,512	2,295	50,430	3,237	86,146	91.5	7,19,884	-7,15,102	-7,15,102	-9,700	342,102	342,102	
Central Pac. Lines in Vermont	Sept. 457	1,121,619	42,29,682	22,88,009	1,89,050	4,207,469	430,928	1,75,527	1,75,527	89,501	1,75,013	64,72	19,747	-141,927	-141,927	-19,807	-342,887	-342,887
Central of Georgia	Sept. 1,044	786,096	78,061	73,832	33,689	3,756	101,130	76,635	59,042	157,359	177.3	19,747	-141,927	-141,927	-19,807	147,878	147,878	
Central Vermont	Sept. 457	1,166,356	435,825	4,042,286	780,303	58,023	4,042,286	3,938	3,938	1,340,946	101.4	-18,485	-108,135	-108,135	-28,986	-39,537	-39,537	
Charapeake & Ohio	Sept. 3144	8,736,165	240,575	9,323,488	872,726	1,338,638	144,614	1,897,123	2,712,705	41,027,799	57.7	3,049,254	22,954,750	22,954,750	4,047,080	27,47,430	27,47,430	
Chicago & Eastern Illinois	Sept. 938	66,055,232	2,106,881	71,079,053	12,294,429	1,09,033	1,09,033	1,427,841	17,089,410	55,654	64,560	1,451,862	1,451,862	1,451,862	1,451,862	1,451,862	1,451,862	

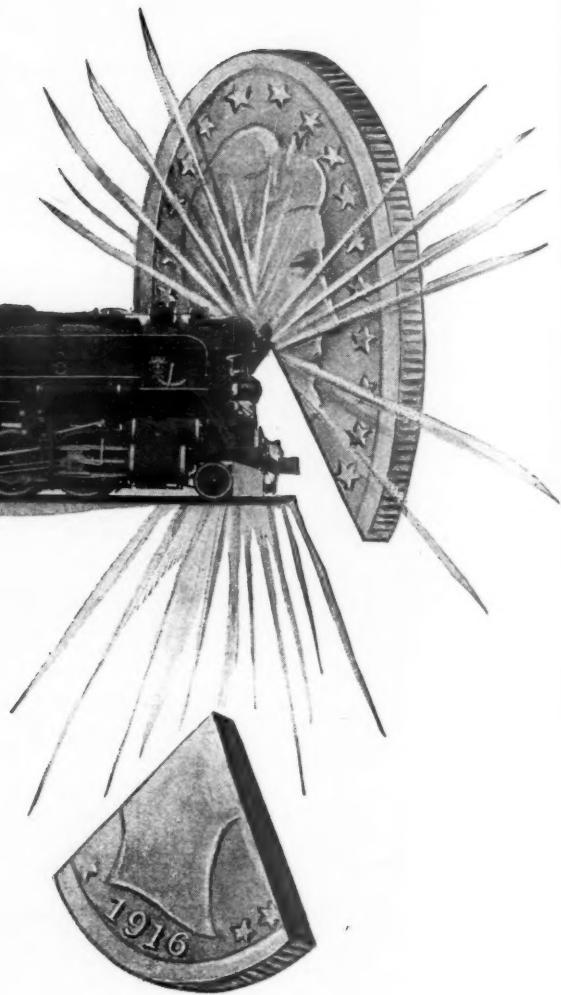
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THE EFFECT OF SUPER-POWER

**Knocking a Quarter from
Every Operating Dollar**



Super-Power Locomotives,
in regular operation, on one
railroad reduced the unit cost
of operation 25 per cent.

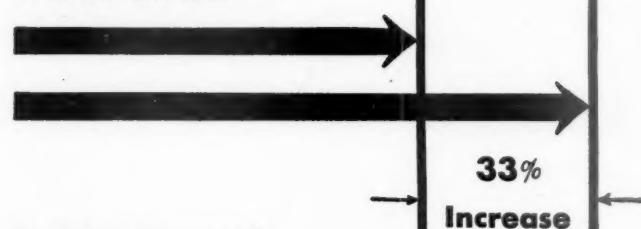


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LOCOMOTIVES ON THE COST OF OPERATION

Train Load

Other Locomotives



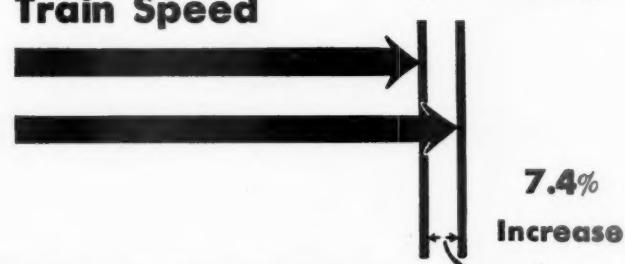
Super-Power Locomotives

33%

Increase

Train Speed

Other Locomotives



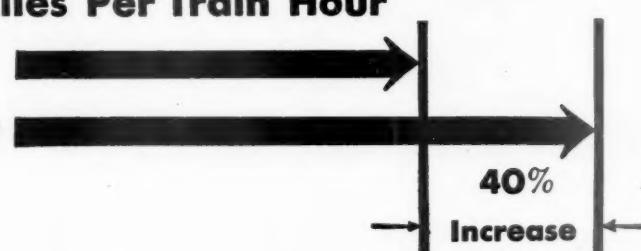
Super-Power Locomotives

7.4%

Increase

Gross Ton Miles Per Train Hour

Other Locomotives



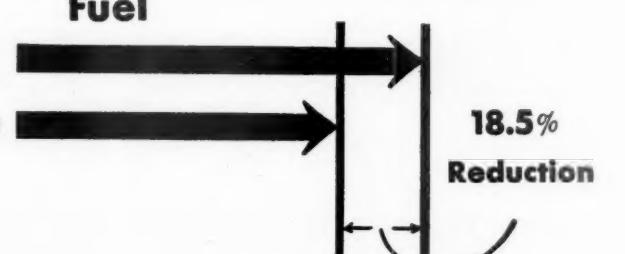
Super-Power Locomotives

40%

Increase

Fuel

Other Locomotives



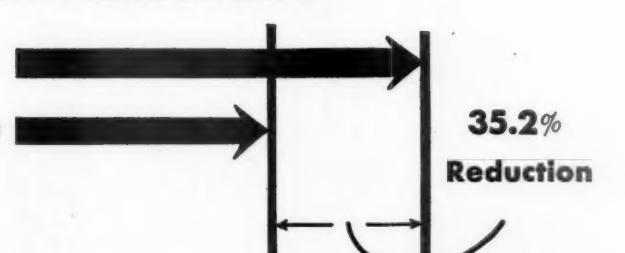
Super-Power Locomotives

18.5%

Reduction

Locomotive Maintenance

Other Locomotives



Super-Power Locomotives

35.2%

Reduction

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues—			Operating expenses—			Net rv. operating income, 1931				
		Freight	Passenger (inc. misc.)	Total	Maintenance of Way and structures	Equipment	Traffic	Trans- portation	General	Total		
Chicago & Illinois Midland.....	Sept.	131	\$114,999	\$1,042	\$123,258	\$15,323	\$31,088	\$16,389	\$44,344	\$14,100	\$121,244	-\$6,532
Chicago & Illinois Midland.....	9 mos.	131	1,374,915	1,2797	1,450,201	138,138	320,826	161,651	456,386	140,087	1,222,093	84,3
Chicago & North Western.....	Sept.	8,442	5,127,494	743,689	6,625,516	860,557	1,029,875	146,212	2,427,848	269,243	4,769,566	72,0
Chicago & North Western.....	9 mos.	8,442	40,551,575	7,898,243	54,607,791	8,035	10,562,329	1,493,897	23,342,247	2,585,030	46,381,827	84,9
Chicago, Burlington & Quincy.....	Sept.	9,256	5,745,452	60,822	5,764,484	59,097	5,926,335	1,121,267	190,601	2,381,988	282,989	67,7
Chicago, Great Western.....	Sept.	1,499	46,877,342	5,764,484	5,984,189	7,252,334	10,976,260	1,959,867	2,663,507	44,184,935	74,4	1,150,239
Chicago, Indianapolis & Louisville.....	Sept.	644	4,763,485	46,775	5,676,577	45,986	49,323	24,579	23,697	50,189,06	15,199,54	1,455,683
Chicago, M. & St Paul & Pacific.....	Sept.	11,254	7,237,305	522,845	8,490,291	1,246,300	1,556,844	237,506	2,588,522	282,978	50,189,06	1,021,267
Chicago River & Indiana.....	Sept.	20	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Chicago, Rock Island & Gulf.....	Sept.	7,620	4,818,633	534,502	5,922,078	552,570	1,084,851	187,033	2,153,238	261,620	4,306,493	72,7
Chicago, Rock Island & Gulf.....	9 mos.	11,267	50,211,109	4,655,564	63,053,973	11,005	14,165,900	2,131,165	2,529,416	2,626,61	55,282,461	87,7
Chicago, Rock Island & Gulf.....	Sept.	721	25,734,539	19,206	27,475	34,139	32,743	16,436	15,067,360	210,722	57,128	221,470
Chicago, Rock Island & Gulf.....	9 mos.	721	2,848,569	221,100	3,087,848	322,861	301,943	13,713	11,067,360	115,295	1,595,866	41,1
Chicago, Rock Island & Gulf.....	Sept.	1,736	2,105,744	142,736	1,470,232	1,737	2,027	23,500	226,000	172,986	20,057,284	66,6
Colorado & Southern.....	Sept.	3,250,088	1,874,056	1,321,562	11,208,892	1,903,579	2,076,550	302,041	5,184,999	573,756	10,095,290	90,1
Clinchfield R. R.	Sept.	309	338,873	2,131	342,5414	281,85	328,943	301,943	155,060	1,071,092	20,381	154,836
Columbus & Greenville.....	Sept.	1,030	2,858,099	21,070	2,922,804	381,653	785,579	145,567	621,034	127,415	2,060,919	70,5
Conemaugh & Black Lick.....	Sept.	874	367,550	41,994	472,154	42,577	30,943	17,489	63,360	127,414	210,176	75,5
Daleworth & Denver City.....	Sept.	731	3,251,050	365,910	4,174,936	460,840	674,200	151,000	1,354,027	303,367	2,715,942	65,1
Daleworth & Hudson.....	Sept.	167	63,058	421,19	72,079	17,372	11,628	30,082	26,039	9,543	67,616	93,8
Daleworth & Hudson.....	9 mos.	167	433,877	44,145	544,901	164,691	101,129	28,946	222,066	93,607	112,044	112,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	14,897,141	1,12,711	17,367,998	2,753,254	4,860,874	463,953	7,351,503	135,597	1,817,190	92,4
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	14,897,141	1,12,711	17,367,998	2,753,254	4,860,874	463,953	7,351,503	135,597	1,817,190	92,4
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	9 mos.	854	1,675,775	145,611	2,464,127	3,966,00	69,133	3,345	160,13	33,116	302,647	123,0
Daleworth & Hudson.....	Sept.	854	1,675,775									



**THE NEW
ALCO
TYPE-K
REVERSE
GEAR**

RAILWAY men when buying reverse gears can now get in the Alco Gear a choice of two different constructions.

They can still get the regular well known Type "G" Gear with its crosshead and guides.

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**American Locomotive Company
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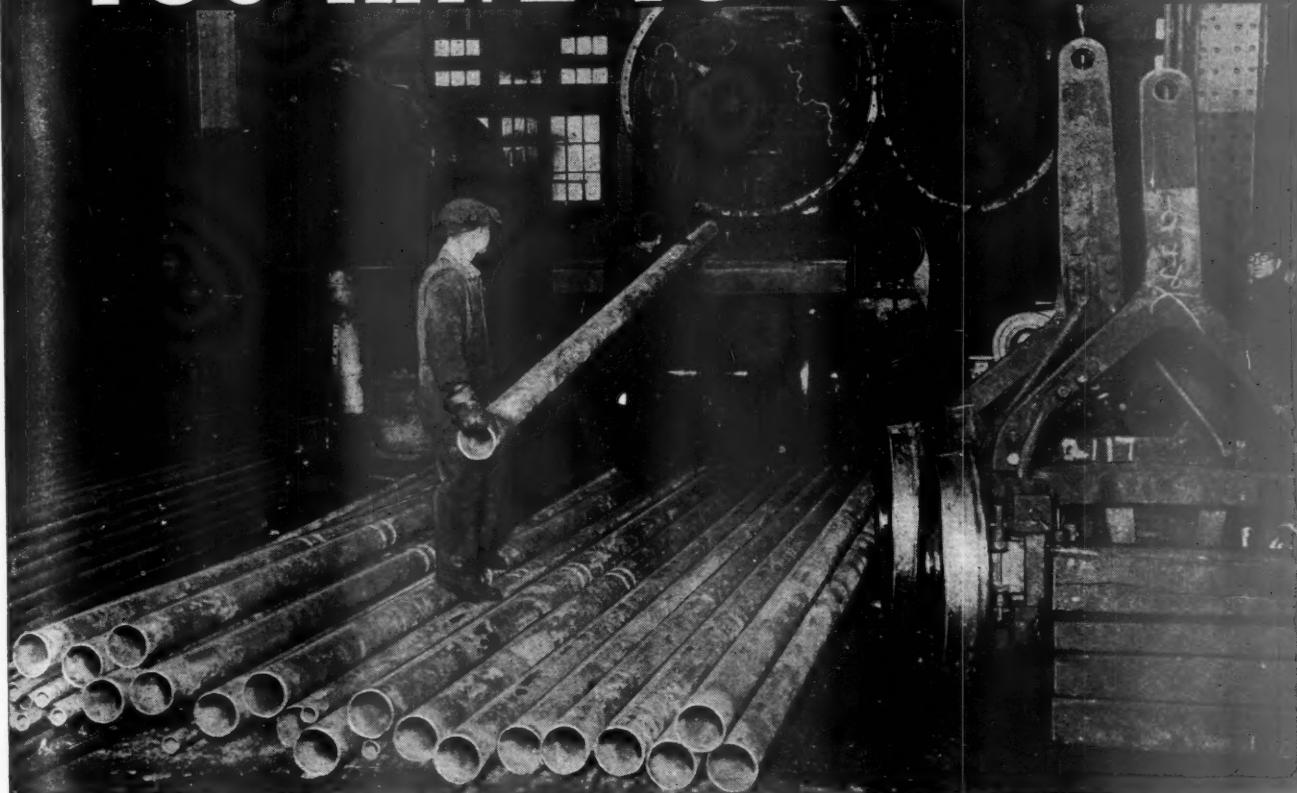
Revenues and Expenses of Railways

MONTH OR SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues—			Operating expenses—			Net rev. operating income, 1931
		Freight	Passenger (inc. misc.)	Total	Traffic	Trans- portation	General	
New Jersey & New York	Sept.	45	\$18,200	\$17,641	\$10,051	\$22,120	\$13,715	\$15,281
	9 mos.	45	18,500	16,501	87,320	220,310	43,907	14,578
N. Y., Susquehanna & Western	Sept.	131	23,165	27,415	32,034	49,826	102,255	9,564
	9 mos.	131	21,383	5,884	274,135	2,362,816	281,266	41,822
Florida East Coast	Sept.	863	193,190	53,625	102,391	120,862	122,869	107,524
	9 mos.	864	3,191,866	1,322,581	5,345,323	97,135	1,017,123	1,017,123
Fort Smith & Western	Sept.	249	68,130	11,111	11,132	4,867	21,237	15,557
	9 mos.	249	426,614	10,565	472,795	121,442	88,278	42,230
Galveston Wharf	Sept.	11	.....	92,599	40,494	3,386	3,450	18,781
	9 mos.	11	225,980	16,316	1,254,582	391,617	40,621	32,110
Georgia R. R.	Sept.	329	1,803,746	155,791	2,132,037	32,697	43,242	17,192
	9 mos.	329	1,022	9,028,094	622,632	10,504,695	290,221	165,780
Georgia & Florida	Sept.	463	63,063	2,579	70,353	15,936	8,338	28,920
	9 mos.	463	58,628	14,665	64,943	167,883	141,009	77,058
Grand Trunk Western	Sept.	1,022	89,343	59,505	1,028,845	18,871	232,714	40,986
	9 mos.	1,022	8,460	5,29,577	32,094	1,023,450	2,354,569	419,490
Canadian Nat'l Lines in New Eng.	Sept.	172	55,364	10,369	78,908	20,370	18,085	55,758
	9 mos.	172	680,478	80,262	878,342	206,345	186,440	32,817
Great Northern	Sept.	8,392	32,399,145	3,087,557	39,699,502	6,433,063	9,630,031	1,647,419
	9 mos.	8,392	92,593	92,535	12,623	140,534	102,345	166,947
Green Bay & Western	Sept.	234	93,493	1,143	86,934	25,802	14,845	4,184
	9 mos.	234	82,786	12,623	86,937	188,196	140,534	39,966
Gulf & Ship Island	Sept.	307	75,512	9,502	97,135	12,370	15,265	4,656
	9 mos.	307	585,543	89,132	783,755	92,903	126,831	28,831
Gulf, Mobile & Northern	Sept.	733	275,574	9,425	304,002	35,997	54,702	21,413
	9 mos.	5,014	5,721,123	89,510	633,279	57,578	495,957	206,158
Illinois Central	Sept.	5,016	45,924,442	6,444,335	57,472,659	4,997,625	11,785,597	16,511
	9 mos.	5,016	6,687	6,712,264	710,463	683,360	1,422,843	189,727
Yazoo & Mississippi Valley	Sept.	1,673	991,141	771,184	1,128,441	74,264	131,842	27,564
	9 mos.	1,673	7,256,620	730,313	818,536	1,235,172	286,858	3,789,683
Illinois Central System	Sept.	6,692	53,179,952	7,174,648	6,598,481	235,787	2,049,627	25,635,960
	9 mos.	6,692	5,645,296	23,280	755,969	6,598,481	1,145,934	399,915
Illinois Terminal	Sept.	542	318,532	51,956	387,300	54,321	44,885	15,728
	9 mos.	543	2,129,896	506,108	8,641,441	4,236,235	442,226	1,281,162
Kansas City Southern	Sept.	783	5,460,171	235,787	6,598,481	7,104,633	1,422,843	117,876
	9 mos.	783	15,884	15,208	15,389	15,281	18,191	2,049,627
Texarkana & Ft. Smith	Sept.	99	85,170	1,709	96,280	10,384	9,112	6,046
	9 mos.	99	729,224	15,208	6,598,481	15,389	75,859	27,501
Kansas, Oklahoma & Gulf	Sept.	326	1,287,594	3,856	1,316,591	161,339	146,057	83,348
	9 mos.	326	1,362	2,373,441	2,206,688	28,583,905	2,557,343	1,078,124
Lake Superior & Ishpeming	Sept.	160	63,457	94	74,504	19,361	9,545	540
	9 mos.	160	268,221	811	46,820	3,268	4,759	4,957
Lake Terminal	Sept.	12	.....	.....	23,069	35,374	.....	126,004
	9 mos.	12	2,401,059	4,473	2,430,210	312,151	524,618	17,651
Lehigh Valley	Sept.	96	119,355	634	126,893	10,767	15,868	3,931
	9 mos.	96	1,101,505	4,487	1,180,386	2,591,490	155,138	1,078,124
Louisiana & Arkansas	Sept.	608	2,164,668	10,413	267,435	29,048	50,276	55,720
	9 mos.	608	3,339,410	83,403	3,065,429	472,110	511,246	190,504
Lehigh & Hudson River	Sept.	255	73,774	4,435	81,586	13,766	7,106	2,804
	9 mos.	255	4,772,762	3,963	81,586	11,966	6,041	2,804
Louisiana, Arkansas & Texas	Sept.	5,258	37,719,703	5,599,589	6,16,598	11,184	1,074,801	1,074,801
	9 mos.	5,258	4,772,762	4,057,138	46,881,268	7,079,941	10,295,238	1,591,221
Louisville & Nashville	Sept.	5,262	38,945,032	4,057,138	46,881,268	7,079,941	10,295,238	1,591,221

Continued on next left-hand page

CUT DOWN ON THE TUBES YOU HAVE TO CUT OUT



Does corrosion cause trouble with boiler tubes? Tubes of Toncan Iron have superior corrosion resistance gained by alloying refined iron, copper and molybdenum. « Do you find high temperatures gradually causing tube destruction? Toncan Iron tubes have a high resistance to fire-cracking that is unaffected by cold working. « Does vibration cause weakening of the tube structure? Toncan Iron possesses such splendid fatigue resistance that it is used extensively for staybolts « Whatever trouble you may be having with boiler tubes can be overcome with tubes of Toncan Iron.

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[Toncan Iron is admirably adapted for safe-ends even where corrosion is not a factor . . . because of its softness and ease of application.]

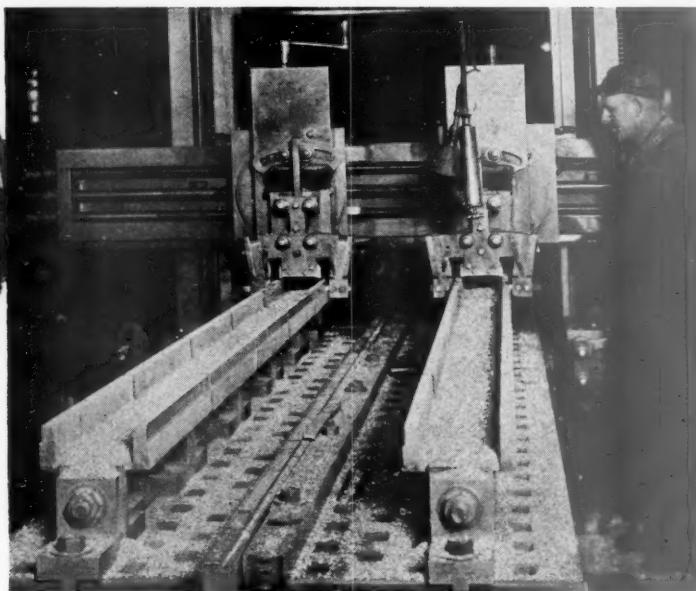
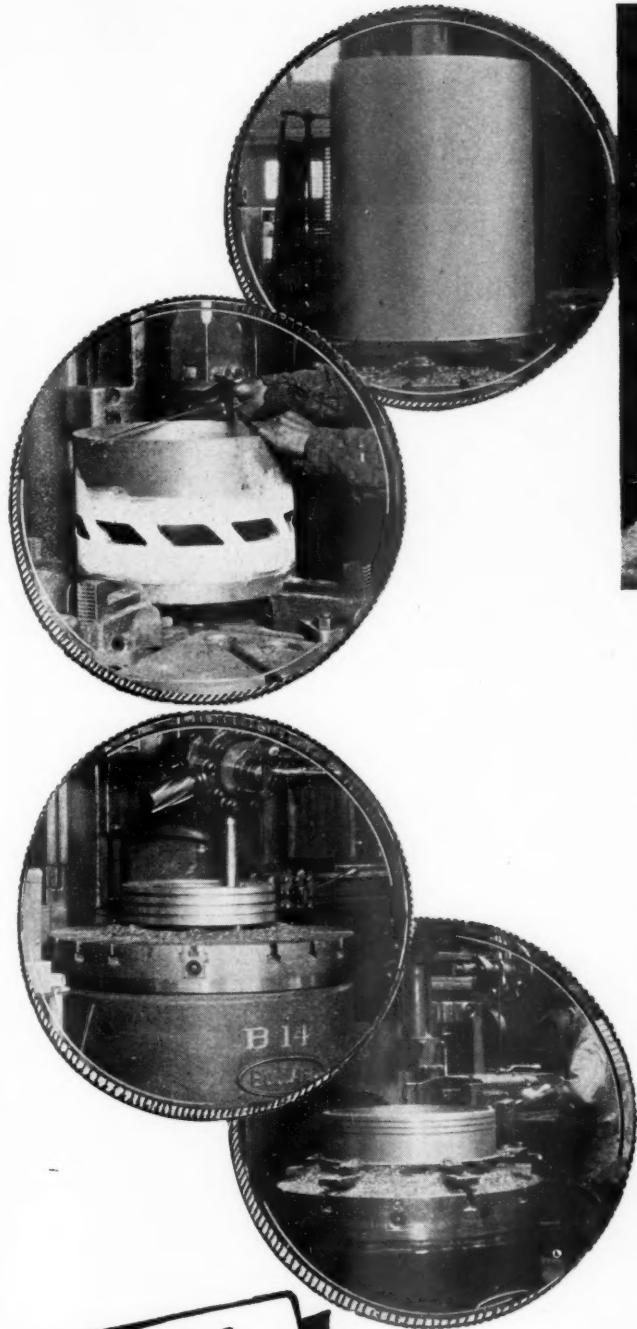
REPUBLIC STEEL
CORPORATION
GENERAL OFFICES R YOUNGSTOWN, OHIO



Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Net ry. operating income, 1931
		Freight	Passenger (inc. misc.)	Total	Maintenance of equipment	Traffic	Transportation	
Maine Central	Sept. 9 mos.	\$100,173	\$875,456	\$1,176,629	\$13,976	\$336,352	\$35,167	\$215,098
1,121	6,756,444	967,955	8,662,332	1,442,254	\$156,366	\$3,406,018	\$660,358	\$142,952
Midland Valley	Sept. 9 mos.	1,198	1,37,519	21,423	10,634	29,866	6,363	1,917,522
363	132,216	6,825	1,112,210	175,162	126,017	280,526	69,097	70,042
Minneapolis & St. Louis	Sept. 9 mos.	1,627	730,768	20,087	796,215	103,005	29,414	40,000
1,627	5,227,769	199,441	5,811,091	929,635	1,206,755	279,063	2,80,282	\$35,167
3,349	2,027,422	135,278	2,38,469	312,937	364,147	797,112	1,655,545	1,442,254
363	1,07,756	6,825	1,112,210	175,162	126,017	280,526	69,097	70,042
4,349	13,937,896	1,143,344	16,561,819	2,520,323	3,851,347	615,034	976,533	15,319,920
Duluth, South Shore & Atlantic	Sept. 9 mos.	560	116,161	13,005	144,612	34,103	71,157	71,294
560	1,012,054	126,998	1,274,802	310,451	60,122	65,730	8,268	156,548
163	45,776	2,145	51,839	13,534	4,856	2,529	1,432	1,161,159
163	350,589	21,624	410,227	138,175	44,527	25,330	19,211	1,917,522
Mississippi Central	Sept. 9 mos.	150	63,022	1,237	66,197	4,202	9,906	18,001
150	431,804	12,359	461,690	70,560	10,203	68,984	1,19,943	5,093
364	70,239	1,247	77,716	14,923	8,201	5,933	1,27,777	1,19,943
364	584,117	12,366	643,596	145,226	96,933	68,498	255,576	197,500
Missouri & North Arkansas Lines	Sept. 9 mos.	202	74,030	370	76,117	13,377	14,888	24,045
202	641,890	4,388	66,197	117,884	119,943	28,636	5,689	5,093
3,188	1,843,110	1,94,141	225,017	226,755	286,607	99,837	129,488	1,40,083
3,188	16,104,053	1,7,017,13	19,844,418	2,419,366	2,893,457	1,003,761	6,931,177	1,19,943
Missouri Pacific	Sept. 9 mos.	7,436	5,410,625	352,518	6,282,041	1,039,562	207,273	2,095,590
7,436	43,488,170	3,632,199	51,966,541	5,763,038	9,553,431	2,082,374	2,042,374	2,042,374
316	880,530	34,585	40,100	54,100	116,001	20,986	151,515	151,515
1,030	5,627,611	350,291	6,359,189	725,593	1,150,352	322,186	1,756,754	407,167
1,030	5,627,611	350,291	6,359,189	725,593	1,150,352	322,186	1,756,754	407,167
International-Great Northern	Sept. 9 mos.	1,159	222,521	65,287	82,576	129,798	24,370	327,328
1,159	6,214,938	606,091	7,610,264	992,995	1,384,502	263,061	3,191,068	462,107
1,159	5,291,139	215,851	5,882,094	1,134,223	9,986	4,045	1,442	6,359,061
1,159	40,779	5,143	51,502	20,986	19,909	1,793	6,228	102,8
316	656,599	53,884	769,058	183,050	108,771	41,464	195,268	46,458
1,159	5,291,139	215,851	5,882,094	1,134,223	9,986	4,045	1,442	6,359,061
1,159	40,779	5,143	51,502	20,986	19,909	1,793	6,228	102,8
1,159	5,291,139	215,851	5,882,094	1,134,223	9,986	4,045	1,442	6,359,061
1,159	40,779	5,143	51,502	20,986	19,909	1,793	6,228	102,8
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1,159	5,291,139	215,851	5,882,094	1,134,223	9,986	4,045	1,442	6,359,061
1,159	40,779	5,143	51,502	20,986	19,909	1,793	6,228	102,8
1,159	5,291,139	215,851	5,882,094	1,134,223	9,986	4,045	1,442	6,359,061
1,159	40,779	5,143	51,502	20,986	19,9			



UNIFORMITY Saves Money In The Shop

THE quality of the material is just as big a factor in determining machining costs as the ability of the operator and the efficiency of the unit.

Castings made of HUNT-SPILLER Air Furnace GUN IRON are free from those foundry defects which compel operators to use slow speeds in order to protect the set-up and cutting tools.

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Dunbar Sectional Type
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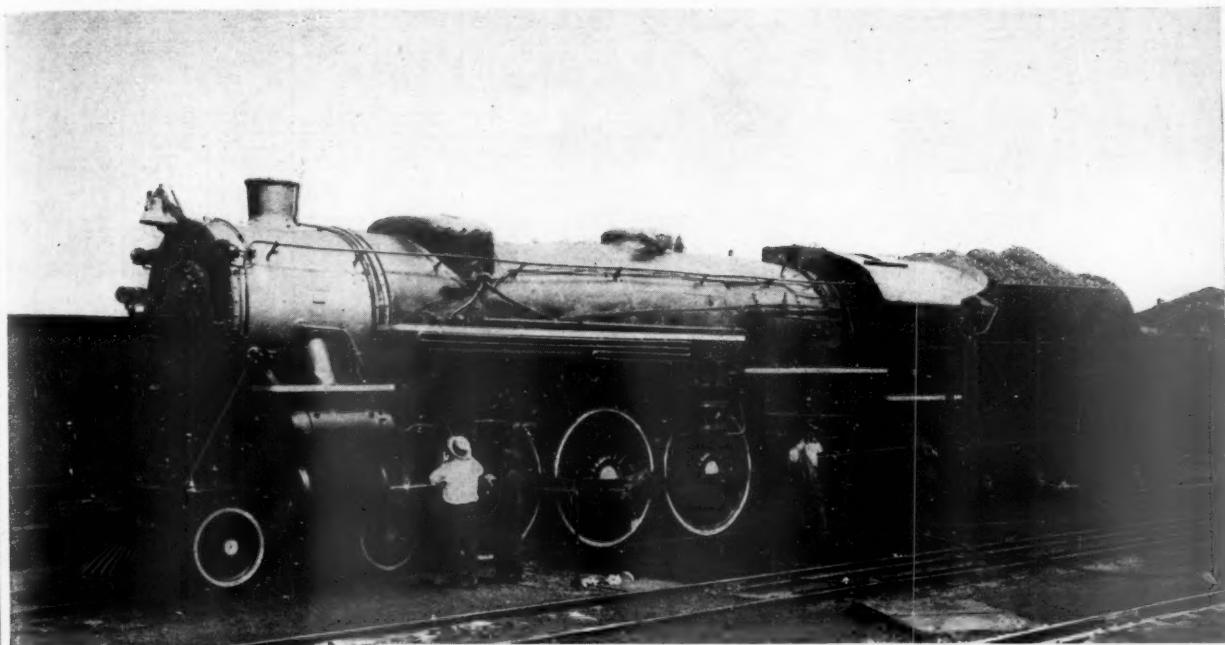
HUNT-SPILLER GUN IRON

Revenues and Expenses of Railways

Month of September and Nine Months of Calendar Year 1932—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues		Operating expenses		Net from railway operation	Operating income	Net ry. operating income
		Freight	Pasenger (inc. misc.)	Maintenance of equipment	Traffic			
New York Connecting.....	Sept.	20	\$224,665	\$18,240	\$5,840	\$852	\$48,128	20.2
	9 mos.		2,664,262	238,250	42,003	223,166	426,853	1,190,122
New York, Ontario & Western.....	Sept.	568	1,798,986	1,759,489	120,188	255,286	243,313	\$152,522
	9 mos.		5,662,031	64,951	136,124	131,515	692,737	1,000,516
Norfolk & Western.....	Sept.	568	6,362,031	563,756	8,017,635	1,359,089	2,948,584	\$118,069
	9 mos.					218,976	5,658,504	632,696
Norfolk Southern.....	Sept.	932	338,008	1,231,403	44,563,991	8,505,742	2,124,795	10,74,663
	9 mos.		2,986,425	168,438	366,396	8,431	2,485,257	11,464,611
Northern Pacific.....	Sept.	6,735	4,381,653	166,191	5,464,407	5,150,016	1,254,553	2,889,888
	9 mos.	6,735	28,545,601	292,729	5,075,457	5,94,614	1,520,922	52.9
Northwestern Pacific.....	Sept.	441	168,438	292,705	34,980,386	4,894,106	1,469,860	1,998,734
	9 mos.		839,102	92,605	289,480	8,505,742	11,810,031	2,127,107
Oklahoma City-Ada-Atoka.....	Sept.	132	30,782	428	33,103	5,451	1,501	1,254,553
	9 mos.		132	277,538	4,257	298,810	7,824	2,889,888
Pennsylvania Railroad.....	Sept.	10,897	19,185,261	4,880,028	26,972,153	4,771,891	1,476,119	1,998,734
	9 mos.	10,897	176,052,148	46,733,579	250,620,812	20,109,518	49,758,844	2,127,107
Long Island.....	Sept.	399	508,284	1,775,404	2,408,421	169,326	267,648	1,254,553
	9 mos.	399	5,012,997	15,731,872	21,916,080	1,658,052	2,986,038	1,998,734
Peoria & Pekin Union.....	Sept.	17	10,115	84,454	Dr. 3	10,052	7,282	1,254,553
	9 mos.					72,076	68,532	1,998,734
Pere Marquette.....	Sept.	2,320	1,528,070	74,426	1,724,388	225,521	385,598	1,254,553
	9 mos.	2,311	14,096,663	71,173	15,822,819	2,211,673	3,558,175	1,998,734
Pittsburg & Shawmut.....	Sept.	102	73,302	619	7,678	6,725	23,576	1,254,553
	9 mos.	102	568,468	5,214	581,236	81,250	199,139	1,998,734
Pittsburgh & West Virginia.....	Sept.	138	179,788	104	190,720	18,561	46,068	1,254,553
	9 mos.	138	1,504,662	832	1,635,572	17,160	48,932	1,998,734
Pittsburg, Shawmut & Northern.....	Sept.	197	665,188	76,281	18,111	15,432	1,372	1,254,553
	9 mos.	197	665,387	2,293	688,466	161,697	17,269	1,998,734
Reading.....	Sept.	1,461	3,514,495	245,416	4,04,235	300,672	73,229	1,254,553
	9 mos.	1,460	32,783,704	2,570,941	38,428,278	3,457,250	6,753,693	1,998,734
Atlantic City.....	Sept.	163	65,851	120,624	147,220	18,570	3,572	1,254,553
	9 mos.	163	666,559	863,693	1,579,483	199,481	162,976	1,998,734
Richmond, Fredericksburg & Potomac Sept.	Sept.	117	195,206	91,039	376,705	35,104	81,067	1,254,553
	9 mos.	117	2,785,193	1,214,799	4,968,725	452,250	1,013,283	1,998,734
Rutland.....	Sept.	413	1,888,051	377,972	3,496,790	67,323	61,930	1,254,553
	9 mos.	413	1,888,051	377,972	2,986,274	542,338	576,900	1,998,734
St. Louis-San Francisco & Texas.....	Sept.	5,266	3,034,944	238,339	3,574,760	475,329	736,780	1,254,553
	9 mos.	5,266	25,389,329	2,454,866	30,538,555	4,208,590	6,753,693	1,998,734
Ft. Worth & Rio Grande.....	Sept.	233	22,224	1,392	3,613	20,167	6,753,693	1,254,553
	9 mos.	233	285,605	13,682	35,006	164,185	11,906	1,998,734
San Diego & Arizona.....	Sept.	155	21,187	5,873	29,387	11,496	9,451	1,254,553
	9 mos.	155	258,008	37,057	31,394	24,041	8,078	1,998,734
Seaboard Air Line.....	Sept.	4,389	1,742,271	195,165	2,157,201	3,434,226	1,486,240	1,254,553
	9 mos.	4,445	18,824,478	2,127,490	23,301,854	3,825,908	5,103,931	1,315,671
Southern Railway.....	Sept.	6,721	5,179,185	67,2843	6,385,104	776,093	1,376,069	1,254,553
	9 mos.	6,721	43,169,111	4,753	77,247	16,755	1,204,657	1,998,734
Alabama Great Southern.....	Sept.	315	1,012,108	19,616	1,085,808	1,66,988	81,265	1,254,553
	9 mos.	315	2,389,655	407,303	3,07,748	559,854	922,782	1,998,734
Cinc., N. Orleans & Tex. Pac.	Sept.	337	6,698,128	55,051	802,014	89,566	203,795	1,254,553
	9 mos.	337	6,566,420	597,367	7,665,891	1,107,849	2,075,590	2,21,262

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An Advantage At The Pit

Breaking clinkers and raking fires to the back end of the firebox to be dropped through a dump grate is a hard job.

FIREBARS do not require a dump grate. The trunnion centers are a foot apart permitting a wide opening.

Thin fires which are

BETTER FIRES

and in which clinkers do not form, are easily dumped.

There is a big advantage in this.



FIREBAR DIVISION OF

WAUGH EQUIPMENT COMPANY

NEW YORK

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Research Laboratory and General Office—DEPEW, N. Y.

CANADIAN WAUGH EQUIPMENT CO., LTD., MONTREAL, QUE.

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Net operating income, 1931
		Freight	Pasenger (inc. misc.)	Total	Maintenance of equipment	Traffic	Trans- portation	
Georgia Southern & Florida	Sept. 9 mos.	\$96,967	\$128,913	\$20,968	\$36,516	\$1,469	\$46,756	\$2,367
	1,07,619	1,456,735	284,737	392,043	16,736	515,926	21,067	\$15,986
New Orleans & Northeastern	Sept. 9 mos.	1,32,389	1,62,474	24,620	43,656	6,758	61,534	1,04,072
	1,82,214	1,518,433	27,923	42,175	60,845	61,915	1,490,711	15,910
Northern Alabama	Sept. 9 mos.	40,619	889	4,658	8,107	1,300	722	1,321
	99	317,411	10,146	342,250	97,212	12,460	10,375	13,096
Southern Pacific	Sept. 9 mos.	59,399,965	1,457,511	9,616,555	873,183	1,503,379	288,104	66,067
	14,581,235	81,771,945	8,900,730	14,669,628	2,648,678	30,149,448	4,979,428	15,910
So. Pac. Steamship Lines	Sept. 9 mos.	379,795	229,935	423,496	12,064	102,174	16,409	107,190
	4,602	2,976,725	3,371,486	136,482	1,003,647	161,118	2,562,190	2,499
Texas & New Orleans	Sept. 9 mos.	1,951,390	252,555	3,541,720	1,500,382	1,78,512	1,949,142	74,611
	4,616	18,148,310	2,493,530	23,511,382	3,840,558	4,834,066	1,148,523	43,926
Spokane, Portland & Seattle	Sept. 9 mos.	460,622	46,382	548,456	70,384	62,385	10,459	3,357,794
	552	3,042,557	349,983	473,265	557,265	96,902	1,355,379	3,357,794
Tennessee Central	Sept. 9 mos.	143,449	41,792	151,520	21,126	23,334	513,239	27,747
	1,226,024	1,342,662	224,481	197,963	58,411	92,208	1,085,198	12,302
Terminal R. R. Assn. of St. Louis	Sept. 9 mos.	55	...	427,612	58,818	29,294	3,803	178,474
	1,950	30,490	998	427,612	555,810	287,419	35,186	178,474
Texas & Pacific	Sept. 9 mos.	12,087,988	1,677,206	15,712,565	1,574,005	2,849,323	62,179	3,344,666
	239	45,383	7,637	517,408	89,948	102,024	28,035	4,425,402
Toledo, Peoria & Western	Sept. 9 mos.	1,065,004	365	1,082,283	256,329	106,783	113,189	1,082,283
Toledo Terminal	Sept. 9 mos.	162	30,490	998	37,588	9,035	10,077	21,768
	162	45,383	7,637	517,408	89,948	102,024	28,035	21,768
Union Pacific	Sept. 9 mos.	329	1,065,004	365	1,082,283	256,329	106,783	1,082,283
Union R. R. of Penna	Sept. 9 mos.	45	...	51,045	4,030	9,994	447	21,768
	295	55	...	55,084	53,985	103,901	4,501	21,768
Oregon Short Line	Sept. 9 mos.	2,506	12,198,189	1,100,209	14,626,251	1,757,309	843,200	1,325
Union Pacific	Sept. 9 mos.	3,768	5,574,773	542,076	6,632,512	461,008	1,059,230	23,400
	3,768	38,911,145	4,870,805	48,663,451	4,034,576	9,393,874	1,169,534	23,400
Oregon Short Line	Sept. 9 mos.	1,374,744	2,161,744	1,86,211	210,209	33,335	162,125	23,400
Oregon Short Line	Sept. 9 mos.	1,206,220	14,626,251	1,757,309	20,006,851	370,779	5,027,581	23,400
Oregon-Wash. R. R. & Nav. Co	Sept. 9 mos.	2,338	1,012,377	116,497	1,267,245	151,676	169,875	228,889
	258	1,556,034	27,062	1,666,987	217,181	213,422	22,538	228,889
Los Angeles & Salt Lake	Sept. 9 mos.	1,249	1,000,533	160,545	1,319,330	7,381	22,992	36,429
	900,221	1,506,822	11,575,914	1,124,047	1,639,478	470,638	3,396	36,429
St. Joseph & Grand Island	Sept. 9 mos.	608	986,226	4,602	1,036,444	108,156	28,388	479,003
	608	8,833,390	59,375	9,371,075	966,981	1,833,337	145,218	18,339
Virginian	Sept. 9 mos.	2,523	2,70,824	213,032	3,153,002	358,901	494,307	14,465
	2,523	24,234,177	1,946,265	28,235,572	3,991,876	4,718,778	1,407,862	14,465
Utah	Sept. 9 mos.	111	723,255	...	...	...	...	14,465
Ann Arbor	Sept. 9 mos.	1,163	1,027,808	2,430	3,020,035	26,744	2,310	14,465
	293	1,556,034	2,350,074	1,666,987	217,181	213,422	22,538	14,465
Western Maryland	Sept. 9 mos.	892	955,555	6,779	1,002,327	80,524	147,905	22,512
	8,359,571	73,400	1,065,037	1,595,085	34,902	2,366,128	348,314	22,512
Western Pacific	Sept. 9 mos.	608	986,226	4,602	1,036,444	108,156	28,388	479,003
	608	8,833,390	59,375	9,371,075	966,981	1,833,337	145,218	18,339
Wabash	Sept. 9 mos.	2,523	2,70,824	213,032	3,153,002	358,901	494,307	14,465
	2,523	24,234,177	1,946,265	28,235,572	3,991,876	4,718,778	1,407,862	14,465
Wichita Falls & Southern	Sept. 9 mos.	203	48,962	58	51,588	10,184	6,942	17,241
	203	412,253	447	42,938	39,486	67,627	1,807	10,184